

amateur radio



VOL. 44, No. 12

DECEMBER 1976

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COVER PHOTO

EMDRC junior member Frank Walsh operating portable station set up in the foyer of the Numaweeding Library. See article on page 8.

(Photograph by Bill Rose)

JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA

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amateur radio

Published monthly as its official journal by the Wireless Institute of Australia, founded 1910.

DECEMBER 1976

Vol. 44 No. 12

PRICE: 90 CENTS

(Sent free and post paid to all members)

Registered Office:

2/517 Toorak Road,
Toorak, Victoria, 3142.

Registered with the G.P.O. Melbourne for transmission by Post as a Periodical — Category "B".

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Copy is required by the third of each month.

Acknowledgment may not be made unless specially requested. All important items should be sent by certified mail.

The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying any reason.

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Hamads should be sent direct to P.O. Box 150, Toorak, Vic., 3142, by the 3rd of the month preceding publication.

Trade Practices Act:

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Printers: EQUITY PRESS PTY. LTD.

59-62 Islington Street, Collingwood, 3066

Tel.: 41-6054, 41-5055

QSP LET'S LOOK AT THE YEAR

In 1976

The WIA was invited to join the Australian Planning Group for WARC 79 and has been represented at all meetings held so far.

The IARU held the first ever inter-regional conference in its history. Much forward planning was done at this conference on the Amateur Services stance for WARC 79.

This conference, being well aware of the problems of the small society, or country with no society at all, initiated the preparation of material for our "Amateur Radio World Wide Position Paper" for their assistance.

The WIA appointed a Federal Education Co-ordinator as it was felt there was a distinct need to widen our horizon in this area.

The WIA made numerous suggestions to the authorities with regard to examinations, and at present the Education Co-ordinator is discussing these with the examination section of the RFMB.

The reaction to the Arnold Report gave the impression that most divisions are satisfied with the present organisational system. However during my trip to Queensland which extended as far as Townsville it was apparent that the members who live well away from their divisional H.Q. have different requirements from those who live in the capital city.

Taking these matters and many others mentioned throughout the year in WIANEWS it is easy to see that 1977 will be another very busy year for the executive, with many very critical matters under negotiation.

I would like to take this opportunity of wishing you all the Season's Greetings on behalf of the executive and Executive Office.

DAVID WARDLAW

EDITOR'S DESK

Bill Roper, VK3ARZ

This being the final issue for 1976 the Editors and members of the Publications Committee wish to take this opportunity to wish you all a Very Merry Christmas and a Prosperous New Year.

Because of holiday closures in the printing works, January AR will be delivered immediately before Christmas and should be in the mail before the New Year. The closures also affect February AR which should go out early in the second week of February.

QSP

11th AUSTRALIAN SCOUT JAMBOREE

The 11th Australian Scout Jamboree will take place at Rossmoyne Park, Dandenong from Dec. 29th to Jan. 7th. VK3BSA, the official station of the Jamboree will be operating 24 hours a day for the duration of the Jamboree.

Primary frequencies will be 3.590, 7.090, 14.290, 21.260 and 28.990 MHz.

PUBLICITY

"Very early after taking office, I learned that many members expect their Director to solve all of their problems. An example of this is the problem of bad publicity sometimes received from Citizens Band trouble that appears in the press under the name of 'ham radio'. We all decry such bad publicity and want to do something about it. The League has written hundreds of letters to newspapers about the country telling them the difference between CB and Amateur Radio. Directors write letters. Club and other amateur groups do the same but with seemingly little effect. Sometimes many new hams can seem to get the difference between CB and Amateur Radio in mind, at least over a long period of time" — "Doc" Gmelin, W6ZRT, the ARRL Pacific Division Director writing in Worldradio News, July 1976. He went on to say "sometimes, even when something is printed, it does little good if no one will read it".

TRANSCEIVERS FOR MINES

A report in the S. African Digest of 1-10-76 shows that special low-frequency radio transceivers have been developed for use in gold mines and are to be mass produced early in 1977. The transceivers

provide underground communication with a range of about 300 Mx through solid rock, but base stations could increase this by a further 1000 Mx.

READABILITY FIVE?

Contributors of "Letters to the Editor" and some of the other features in AR, would make the Editor's task a little easier if material that is hand written is done so in a legible manner.

Material submitted for publication should (where possible) be type written, double spaced and on one side of the paper only. Thank you VK3UV.

AR POSTINGS

Very strange or perhaps not so strange in Mr. Murphy's law book. This business of getting AR out on time. No matter what care is taken all along the line something unforeseen fouls up the system more often than not. If a delay of a day or two occurs mid-month it seems reasonable that this will become magnified into four or five days by mailing time. A holiday of weekends intervenes at a critical point to cause that additional delay. On the other hand one would believe that a day or two might not matter so much near the end of the production cycle. Not so. This stretches into maybe 5 or 6 days because perhaps the mailing service had scheduled AR for a particular day but because of the delay their mailing had to be programmed instead and AR thereafter delayed in "the queue". The production of a monthly journal is in the hands of many people all working together to meet a deadline. Unfortunately all of these people (and companies) are also busy with other work, so if AR is late arriving from one link in the chain the delay tends to snowball by reason of throwing other schedules out of gear. Everything possible is done to keep AR production on time, especially is this important to those who live far from Melbourne and suffer the inevitable additional transit delays.

SATELLITE SEARCH AND RESCUE

The Telecommunications Journal Aug. '76 carries a report that the Canadian authorities have successfully demonstrated the feasibility of a new satellite-aided search and rescue concept that could reduce the time fuel and other costs associated with conventional methods of finding downed aircraft. Experiments were employed using Oscar 7 and simulated distress signals showed that a relatively low-cost, low altitude polar orbiting satellite could pinpoint crash sites in Canada and elsewhere in the world to within 8 km in as little as 15 to 20 minutes after the spacecraft first "hears" the signal put out by an ELT operating on 12.5 MHz.

AN UNWANTED EXPORT

It is noted in HR Report that FCC agents and US marshals arrested some dozen outlaw opera-

(Continued on page 5)

WIANEWS

CITIZENS BAND

One of the main topics of discussion in recent months has been CB.

Already reported in WIANEWS Nov. AR the Executive listened to what a group of CBers had to say about legalisation of this service in Australia. The background information from this meeting is likely to be useful when the Government calls for comments on this question in the near future — maybe before the end of this year.

Meanwhile the media are enjoying themselves with CB and almost everyone is getting into the act. If the 'man in the street' reads the material served up to him he would be really naive to believe all of it.

There is no reason at all why amateur radio should be linked with CB. Unfortunately few journalists can resist the temptation to refer to our service, oftentimes in derogatory terms and occasionally in the most offensive manner. Many writers on the subject display their ignorance by incorrect references even to the proper licensing and controlling authority for radio frequency spectrum management.

It seems that we in Australia are not alone in suffering from media falsehoods and deceptions. Those who listened to the Federal tape broadcast on 3rd October will have noted the problems experienced in the U.S.A. on bad publicity appearing in the press under the guise of "ham radio". Doc Gmelin, W6ZRJ, the Pacific Director of ARRL had a lot to say about this in a recent issue of *Worldradio News*. He bemoaned the fact that it was almost impossible to get the true picture of amateur radio across to the media. His article went on to comment that respect is not bestowed, it is earned, and respect for Amateur Radio comes from the good things we do for the public. Often the radio amateur does not do nearly enough to get attention from the masses, he thinks; even if, by some great good fortune, something good does get into the Press it has little benefit if no-one will read it.

An article in a recent issue of a U.S.A. business magazine carried the news that the CB channels had been increased from 23 to 40 in an attempt to relieve the overcrowding in urban areas. Coupled with this, the article pointed out, was the tightening of equipment specifications to reduce interference to other electronic apparatus, including TV sets, and that the F.C.C. themselves would in future undertake their own testing of CB gear instead of relying on manufacturers' claims.

The announcement by our Minister for P & T that strict standards will be laid down in Australia for CB equipment if citizens band radio is legalised appeared in the press as a warning to purchasers if dumping occurs as the result of the stricter controls in the U.S.A.

The WIA has under consideration a policy not to support any amateur service licence below that of the Novice grade. This had been suggested in several quarters as an alternative to CB or as a transitional stage between CB and Novice. Quite apart from international regulatory obligations there are a number of very cogent reasons why such a permit or licence could create fresh areas of difficulty and complexity. The decision will rest with the Federal Council.

Any member having thoughts about the ACADEMIC concept of CB in Australia would be wise to convey them to his Divisional Council. The Institute will have an opportunity to comment to Government when the question is thrown open for public debate. The attention of the Minister has already been drawn by the Institute to certain fundamentals which can be deduced, as likely to affect the amateur service, but actual detailed comments can only await the precise nature of the proposals if the political decision to introduce CB takes the next step.

Members are fortunate in possessing an Executive responsive to the changing circumstances surrounding radio Communications as a whole and which is quick on behalf of the amateur service to take advantage at the right moment in time of the constant changes going on around us.

EXAMS

The Federal Education Officer held useful discussions with the head of the examinations section of the R.F.M.D. during October. It is understood that the marking of Novice examination papers will henceforward take place in State Offices and that the issue of a syllabus for this examination will be expedited by the Institute preparing one for the section to edit and amend. Consequently Mr. Scott promised to submit a suitable syllabus by the end of November.

Discussions on multi-choice type of questions for all amateur exams were carried one stage further and it is possible that future Regulations exam papers might well include a number of multi-choice questions plus a few essay type questions so as to preserve flexibility.

Pressure was exerted in relation to the need for a greater number of examination centres and the desirability of some thought being given to the invigilation of exams by responsible amateurs. Once again the response was unfavourable in the same way that the response was unfavourable to the increased frequency of examinations.

The submission that Novice exam Morse speeds be altered to faster characters with larger pauses in between was again rejected. The RFMD follows the procedure laid down by ITU in the International Telegraph Regulations and any departure from these principles is regarded as likely to introduce unnecessary complexities particularly in the light of the proposed introduction of centrally prepared tapes by up to date mechanical methods.

The principle of conceded Novice level passes in the AOCP theory exam — namely that those candidates obtaining some percentage below the 70% pass mark should automatically qualify for a pass at Novice level — was previously considered. However, a similar principle applied to the AOCP Morse exam was received with considerable reservation.

It was apparent from the discussions that RFMD is conscious of the international reaction to changes in examination standards as affecting reciprocity. Any measures which would result in any loss of their direct control over examinations were viewed most unfavourably. This principle also acts in reverse. This results in Australia not recognising many overseas, and even academic, amateur licensing qualifications as acceptable either in relation to the syllabus studied or the nature and methods of conducting the examinations.

The thought that some suitable Australia-wide educational institution should conduct examinations on behalf of the licensing authority — as, for example, the London City & Guilds Institute for U.K. examinations — remained merely as a thought.

One meeting of the Executive was held during October at which reports from the various Committees were received and debated.

REPEATERS

One of the most intractable of problems is the condition that Radio Inspectors should be able to switch off any repeater in their area at short notice if the need arises. This is still under discussion.

There arose a proposal that the time seemed ripe for holding another all-States repeater meeting similar to the last one in Wodonga some years ago. It was considered however that the expense involved in holding such a meeting appeared unnecessary when, in reality, the bulk of the difficulties related to adjacent areas in VK2 and VK3 in particular. A joint meeting between the State repeater committees immediately affected appeared more suitable.

A case for additional repeater channels on 2m (see WIANEWS Nov. AR) was believed to be imminently ready for submission. Arising out of this, when it comes to hand, will be the number and extent of active FM net frequencies. Details of the latter would be appreciated by the Federal Repeater Sub-Committee.

In connection with net frequencies an interesting development relates to the exchange of digital information with the aid of microprocessors now becoming more available for amateur use. Another topic discussed was the possible establishment of a repeater for RTTY.

The VHFAC bent their minds once again to the problems of TV channels 0 and 5A. This was reported by the Executive in AR for June 1975 page 31 paragraph 34. The difficulties centre round the 'long distance' reception of a channel 0 station in an area designated for a Ch. 5A translator. The 1976 ABCB report on this question may assist in providing additional material for consideration.

Feedback from Divisions concerning beacons and beacon planning had been negligible. This had retarded progress in this field. Since beacons had been allocated to the VHFAC it was agreed as sensible that this committee would also undertake any planning work needed for 10m band beacons even though this was outside the VHF area.

PENSIONERS

A letter received during October from the Secretary of the P & T Dept. advised that the Minister had indicated his agreement to the reduction of licence fees from \$12 to \$2 for amateur radio operators in receipt of a pension under the Social Services Act subject however to the restriction of the concession to those persons whose pensions were granted subject to the standard means test provisions.

This entails an amendment to the Wireless Telegraphy Regulations which might cause some delay before the proposed concession becomes effective. Readers of WIANEWS will be

aware of the efforts made by the Institute on this question over a long period of time. Letter RB4/4/32 of 19-10-1976 refers.

WICEN

The WICEN organisations of the Federal, ACT, Victorian, W, Australian, Nth. Queensland and some individuals joined together in the Natural Disasters Organisations' annual exercise "BACKUP" on 27th/28th October. Two concurrent disaster situations were simulated, bushfires in VK3 and a cyclone in VK6. Various Federal Departments, State Emergency Services, police, service personnel and others joined in the exercise at very short notice for many.

The Federal WICEN Co-ordinator, Brig. Rex Roseblade, VK1QJ, wrote that the exercise was very successful. Aside from demonstrating to NDO the usefulness of WICEN for the second year in succession, some valuable publicity was obtained for amateur radio and a number of lessons were learned from it. A letter of thanks for assistance by all concerned was received by the Federal President from Major-General Alan Stretton.

The call sign VK1WI was used in Canberra and the 'provisional' WICEN frequencies on the three HF bands were activated with stations identifying messages with the words "WICEN Exercise Station". Exercise traffic was relayed by VHF link to the home QTH of VK1QJ.

QSP—continued

during a raid in northern New Jersey on premises of those engaged in illicit 27 and 28 MHz operation. The report goes on to say that a photo of the seized equipment looks like the transceiver/amplifier counter at any well equipped radio store.

Under the heading "CB radio users jam airwaves, tune in trouble" the Ottawa Citizen details the problems with the General Radio Service, as it is known in Canada. Department of Communications officials are quoted as saying that closing the entire band might be the only solution. The things continue the way they are going. The editorial continues: "Originally designed for urgent general purpose conversations, the system has become, in the words of a department official's refuse pile for the drags of the radio community whose main interest is in hearing themselves talk". Strong sentiments but they reflect a growing mood among government, radio enthusiasts and the public. — From Radio Com., Oct. '76.

CB — U.S.A.

The writer of "Zero Bias" in July 1976 CO has much to write about CB and the continuing general hostility by radio amateurs. "Amateur radio", he writes, "has a lot to offer on its own not at the expense of CB. If we take as fact that CBers like to communicate, buy equipment, put up antennas, engage in public service, seek out awards and QSL cards and intellectually disregard the ethics of legality of the situation, we can see the possibility of presenting an augmentation to their

by rather than a replacement. What we have to offer and how we offer it may or may not be better; this is debatable from where you stand. What is true is that what we offer is different and unique. You know what somebody has or believes just to yourself your own position you are in fact calling him a fool. Why should he continue to listen to you?"

EARTHQUAKE EMERGENCY

A resident radio amateur in the earthquake devastated area of N.E. Italy early in May alerted and carried traffic on the first night of the catastrophe when no other radio communication services were operative. They used three repeaters which were still operational as well as an 80m emergency net. A mobile repeater was used later on. Their efforts were rewarded in a public speech by the General Director of the Italian P. & T. Department in Rome. A detailed report about this emergency appeared in IARU Region 1 News of Sept. '75.

NAVIGATION PROBLEMS

For small craft enthusiasts the following edited extract from an article in Worldradio News of July 1975 might be informative. It was written by an amateur working as Radio Officer aboard both tankers and freighters. "Many yachts and other small craft often misunderstand and underestimate

the manoeuvrability of large ships. A tanker drawing 30 feet or more is often restricted to a channel and cannot turn without going aground. Small craft are very difficult to see at sea. A white hull and white sails are easily lost in the white caps of even the slightest sea. If a moderate-to-heavy sea is running, it is almost impossible to see a yacht. Remember, you can probably see us for miles due to our size and colour, but don't expect us to see you. Most wooden and fibreglass hulls provide a very poor radar target so make sure you have a good radar reflector installed on top of your mast so that you can be seen. Another factor in safe navigation is the visibility from the bridge of a large tanker. The minimum distance of closure to 700 feet (say 220 metres) between the bow and the bridge, and if you approach too close to the bow or cut across her bow you are very easily lost to sight. That can be a very dangerous situation for a small craft."

THOSE WERE THE DAYS

Vicente Kerr VK4KL kindly forwarded a copy of "WIRELESS A Handbook of Instruction for Radio Enthusiasts" circa 1926. It contains over 100 pages of the then most up to date theory and practice. Also included are 8 most interesting pages listing Australian railway stations. These included A and B class stations plus dealers stations as well as the Experimenters (amateurs). Quite a few of the operators listed are still active; Harold Hobler VK4DO and Max Howden VK3BQ to name just two.

Other call signs that were listed and are still going include 2BL, 2FC, 3LO, 3R, 3UZ and 4OG. Even then the "Call Book" had problems — 2W1 was shown against two different operators and the 3B— series of calls preceded the 3A— series.

Australian and New Zealand ships equipped with radio were listed against their call signs.

The advertisements are fascinating. A 1 valve set was available for £9 and 5 valve sets from £24-32. An RCA Radiotron (valve cost 17/6 and 1.5V cell 3/-). Strange to think that all the latest gear advertised in this magazine today will seem quaint also in 50 years time.

WIA EDUCATION

The Education Committee has met twice so far. Graeme Scott VK3ZR is Chairman with John Wilson VK3LM and Peter Cossies VK3BPG as members.

All are teachers and have a background in Radio and Electronics teaching.

The committee set some priorities at its inception. The major one was to draw up suggested syllabi which instructors can follow in amateur

radio courses. Also a published syllabus, if adopted by the P and T Dept. will lay down a framework for the course to which exam questions can be set. The Novice syllabus is expected to be handed to the P and T Dept. by Nov. 30th 1976.

Interested persons are invited to forward suggestions, proposed syllabi for other exams, and multi-choice questions to the chairman via the Executive Office, Toorak.

The P and T Dept. recently asked the WIA to forward 700 multi-choice questions to create an exam bank. This has been done and further information with extra questions is welcomed from members. On the Youth Radio front there is little to report at present.

Graeme VK3ZR,
WIA Education Co-ordinator.

To Be or not To Be — A "Ham" (let)

Doug Anderson VK3ZW, Director Victoria Promotion Committee.

We have all experienced the amused cum tolerant smile as the layman says "Oh so you're a ham are you?" and although my skin is relatively tough, the connotations of the word "Ham" and its consequent public relations value have often caused me to wonder why we accept such a title. I must confess I prefer the term "Amateur".

However, let the Oxford Dictionary (5th edition) be the judge. I quote an extract:

"Ham — (sl) an operator of an Amateur radio station. An inexperienced or ineffectual actor, one who rants and overacts, (sl) Hamfisted, Hamhanded, One who is heavy handed and clumsy".

"Amateur — One who cultivates a thing as a pastime".

Of course its either a matter of habit or taste and in some instances the observance of some obscure tradition that causes the term "Ham" to continue to describe us and our activities but for my part, if any of my neighbours regard me as a "Ham" when they experience their next dose of Hi-Fi I, then I hope they don't look me up in the dictionary.



IC211

2 metres mb/mw/cw



New ICOM IC211 PLL, synthesised
Digital Transceiver

A great new wave

ICOM introduces the first of a great new wave of Amateur Radio, with new styling, new versatility, new integration of functions. You've never laid eyes on a radio like the IC211, but you'll recognise what you've got when you turn on the single-knob frequency control on this compact new model. The IC211 is fully synthesised in 100 Hz or 5 KHz steps, with dual tracking, optically coupled VFO's displayed by 7-segment LED readouts, providing any split.

FEATURES:

- * Frequency memory, main VFO's
- * Noise Blanker
- * Built-in SWR bridge
- * VOT
- * CW monitor
- * AC/DC operation
- * IC/CDM developed PLL
- * Devices incl. 82 transistors, 16 FET, 14 IC, 90 diodes, 1 LSI
- * 144-448 MHz coverage
- * 80 day ICOM warranty

\$659



IN FACT, THERE ARE SO MANY FABULOUS FEATURES IN THIS MODEL, WE WOULD TAKE PAGES TO EXPLAIN THEM! FOR FURTHER INFORMATION AND SPECIFICATIONS PLEASE WRITE INCLOSING A SAE!



... where quality counts!

SYNTHESISED!
NO CRYSTALS
IC225 \$220



The new IC225 (Special Australian Model) is a PLL synthesised rig with programmable RFO for frequencies in the Australian FM allocation. SSB, duplex, duplex or duplex reverse is achieved by a flick of a switch on the front panel. This fabulous new rig features ceramic discriminator, IDC, electronic TU/Rx relay, full VFO protection and ICOM 90 day warranty. Circuitry includes 34 transistors, 7 FETs, 13 ICs and up to 128 diodes. Frequency range 144-448 MHz, 2000 Hz step, 100 Hz substep. Your new IC225 comes complete with mic, mobile mounting bracket, plug, cables, spare diodes for programmable matrix and English instruction manual (Aus. edit. version). You will never need to buy another crystal with the fabulous new - crystal clear - IC225!

SPECIAL KEN Repeaters 2, 3, 4, 5, 6, 7, 8, Simplex 40, 49, 51. Anti-repeat 2. A few only at this price

\$5.00

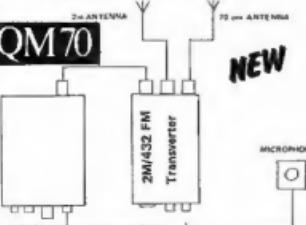
LINEAR FOR TWO \$98

All solid state 70W pep/50W output linear amplifier (for 14W pep input), 12 VDC operation and internal automatic RF sensing switch means that you only need to connect this unit in your 2m antenna line, together with a simple 12 volt 100W power OUTPUT. Accepts 2m, 70cm, or 2m with switchable band for 144, 222, 440, 902, 1296 MHz. Supplied complete with dc power cord and fitted with SO239 sockets. \$98.

TRANSVERTERS 2M High Power

20/144 HIGH POWER TRANSVERTER. A 10 m to 2m hybrid transverter offering up to 200W pep input. Excellent FET receiver converter with two IF outputs fitted as standard. Master oscillator is doubly stabilised and the pa section is well ventilated. Takes all drive and switching from your 10m rig. Built-in antenna change-over relay, featuring a 1-pole for the warning relay. Complete with harness and plug for connection to your 10m rig. \$198.

2M/432 FM Transverter
This small unit obviates the need for the expense of a second transceiver or the complexity of numerous add on or with multiple connecting leads. By simply inserting the unit in the antenna lead of your 2m or 70cm transceiver you are ready to transmit and receive on either 2m or 70cm. AT THE FLICK OF A SWITCH! The unit has its own 70 cm to 2m receiver converter built in and all switching is carried out within the unit. Size 105 mm x 48 mm x 140 mm. Complete with power cord and mobile mounting bracket. Price \$110.



UNIDEN the best value



HF PLL Transceiver



More expensive than an FT101E

Featuring a number of circuit improvements as a result of a year in the field, the "2020" HF PLL transceiver offers separate switchable BPF filters as STANDARD and G1469's in the final IF stage. The 2020 is a solid state transceiver with a built-in 100W PA and dual band switch. Front panel can be removed for easy servicing. A comprehensive range of spare parts are available together with back-up service support. Overseas this rig sells for at least \$95 more than the FT101E. Compare the features of the UNIDEN 2020 with other HF transceivers and you'll be quickly convinced that it offers the best value!

UNIDEN 2020, complete

\$649

Digital VFO

\$149

Matching speaker

\$38

New uniden 2020 Mark II

Vicom for technical support



The Fabulous Atlas 210K solid state transceiver with noise blanker \$225



IC502 \$185

Six metres during the DX season and using the IC502 can be great fun! This handy portable runs 3W pep SSB, 5.2-5.3 MHz. Features noise blanker, RIT, lighted dial and meter, telescopic antenna and of course, the ICOM quality. Includes a 100W PA, 12VDC power, noise blanker, speaker, 9 long-life batteries, factory produced English Manual and 90 day warranty. A comprehensive range of spare parts available. ICOM no required when ordering parts!



\$800



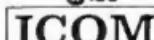
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IC202 \$195

The famous IC202 handy portable runs 3 watts pep with VFO control 144-145.4 MHz. Features noise blanker, RIT, lighted dial and meter, telescopic antenna and of course, the ICOM quality. Includes a 100W PA, 12VDC power, noise blanker, speaker, 9 long-life batteries, factory produced English Manual (revised 2nd Edition) and 90 day warranty.

IC215

\$169



This is ICOM's first FM portable, and it puts good times on the go. Change vehicles, walk through the park, climb a hill, the ICOM quality FM communications go right along with you. Long lasting internal batteries make portable FM really portable, while accessible features make conversion to external power fast and easy!

Fully collapsible antenna

- 15 channels (11 on dial and 3 priority)
- Dual power - 3 watts high/400 mW low, nominal
- Lighted dial and meter
- 36 transistor, 3 FET, 2 IC, 51 diodes
- super sensitive receiver
- Crystalline synthesizers identical to IC22a

Your new IC-215 comes supplied with: 3 popular channels, handheld mic with protective case, shoulder strap, connectors for external power and speaker, 9 long-life C batteries, English manual and 90 day warranty

Vicom for personalised service

Quality VHF/UHF per power meter, up to 120W, no power calibration required. Symph. construction. \$95

CONVERTERS

Quality model technological design features and built-in demodulators. The range of converters has been produced to meet the increasing need of high

POWER CONVERTER

145.8 MHz Crystal Oscillator, Minimum Frequency 144.1 MHz. Model 2000: Amplitude stabilisation. Complete with power supply and antenna connector. Includes 12VDC, 12VAC, 12VDC/12VAC, 12VDC/24VDC, 12VDC/28VDC, 12VDC/32VDC, 12VDC/36VDC, 12VDC/40VDC, 12VDC/44VDC, 12VDC/48VDC, 12VDC/52VDC, 12VDC/56VDC, 12VDC/60VDC, 12VDC/64VDC, 12VDC/68VDC, 12VDC/72VDC, 12VDC/76VDC, 12VDC/80VDC, 12VDC/84VDC, 12VDC/88VDC, 12VDC/92VDC, 12VDC/96VDC, 12VDC/100VDC, 12VDC/104VDC, 12VDC/108VDC, 12VDC/112VDC, 12VDC/116VDC, 12VDC/120VDC, 12VDC/124VDC, 12VDC/128VDC, 12VDC/132VDC, 12VDC/136VDC, 12VDC/140VDC, 12VDC/144VDC, 12VDC/148VDC, 12VDC/152VDC, 12VDC/156VDC, 12VDC/160VDC, 12VDC/164VDC, 12VDC/168VDC, 12VDC/172VDC, 12VDC/176VDC, 12VDC/180VDC, 12VDC/184VDC, 12VDC/188VDC, 12VDC/192VDC, 12VDC/196VDC, 12VDC/200VDC, 12VDC/204VDC, 12VDC/208VDC, 12VDC/212VDC, 12VDC/216VDC, 12VDC/220VDC, 12VDC/224VDC, 12VDC/228VDC, 12VDC/232VDC, 12VDC/236VDC, 12VDC/240VDC, 12VDC/244VDC, 12VDC/248VDC, 12VDC/252VDC, 12VDC/256VDC, 12VDC/260VDC, 12VDC/264VDC, 12VDC/268VDC, 12VDC/272VDC, 12VDC/276VDC, 12VDC/280VDC, 12VDC/284VDC, 12VDC/288VDC, 12VDC/292VDC, 12VDC/296VDC, 12VDC/300VDC, 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hy-gainfor the finest in Ham
Radio Antennas!

QUALITY USA ANTENNAS



| | |
|---|--------|
| 1440/20/1440/10/40, 40 thru 10m quality trap vertical, 10' High, True 1/4 wave resonance on all bands | \$ 75 |
| 10/2M 10' High, the greatest medium vertical performed 80m to 10m, medium, self supports, 24' high | \$ 119 |
| TH303H 3m beam 10/15/20, 10' beam, outstanding performance at reasonable costs | \$ 198 |
| TH303H 3m beam 10/15/20, 12' beam, ideal for compact performance in limited space | \$ 152 |
| TH303H 3m beam 10/15/20, 12' beam, impressive coverage on 10/15/20 | \$ 198 |
| BN85 Balun for the sleeve beams | \$ 25 |
| AS202W (Austral) 20m monobander, 3el, 8 dB gain | \$ 160 |

GO MOBILE HF MOBILE ANTENNAS

| | |
|---|---------|
| AS303A antenna set 80 thru 10 metres, omni headed, end heavy dual beam and spring | \$118 |
| Quality Hustler Resonators, precision etched with optimum design for each band, adjustable fit for lowest loss: | |
| 160 meters | \$21 |
| 80M | \$11.50 |
| 40M | \$25 |
| 20M | \$11 |
| 15M | \$11 |
| 10M | \$11 |
| 2M | \$11 |
| 1.8M | \$11 |
| 1.5M | \$11 |
| 1.2M | \$11 |
| 1.0M | \$11 |
| 0.8M | \$11 |
| 0.6M | \$11 |
| 0.4M | \$11 |
| 0.2M | \$11 |
| 0.1M | \$11 |

Bumper Mount Assembly Model ASNK. Zinc plate steel and stainless steel.

AS303B Heavy Duty Spring and base assembly. Chrome plated steel screw base.

AS303C GUITAR mount

M-ring body mount

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WHO ARE YOU?

Mike Thom VK3ZVN

In October 1975 the Eastern and Mountain District Radio Club changed its venue from the Mooroolbark Technical School to the C.L. Willis room in the Nunawading Civic Centre. At its first meeting in the new venue, the club was addressed by the then Mayor of Nunawading, Cr. Peter James. Of the many topics that Peter spoke about perhaps the one that really struck home was "Who are you? No one in the eastern suburbs has heard of you and what you do".



OVERALL VIEW OF THE DISPLAY AT THE LIBRARY

Like most other amateurs, we had taken the view that it was impossible to get publicity in the local press and therefore, did nothing about trying. However Peter's words did not fall on stony ground and at subsequent committee meetings much discussion centred around publicity and what we could do. As a result, earlier this year, it was decided to approach the Head Librarian at Nunawading Library. Members had noted that the library regularly had static displays of various skills and crafts, why not amateur radio? There was only one way to find out. Very tentatively, I made an appointment to front the lion in its den.

To my delight and surprise I was greeted as manna from heaven. A local organisation was actually interested in its library! The library staff, led by Constance Pavey, the Head Librarian, were actually grateful to us for offering to put on a display. Very quickly a date was decided, it was to be National Library Week, 11-18th September.

To put it mildly, we were on the spot. No-one had anticipated quite that reaction, and we had only a few short months to get it all together. Planning began immediately. Fortunately the library had four large show cases and two domed display units. A visit to the library with a tape measure to get the sizes of the show cases and to decide what to put where. The final layout decided by sub-committees was for a central photographic display with the showcases around it in the central area of the library. Each of the showcases was to cover a specific subject i.e.

Test equipment in one, antennas in the second, VHF Mobile/portable equipment in the third and HF equipment in the fourth.

The two domes would contain home brew equipment. A portable station would

be installed in the foyer on each Saturday.

The search for suitable photographs began and here again we struck it lucky. One of our newer club members, Reg Gouge, was a keen amateur photographer. Reg was very quickly railroaded onto the sub-committee with a brief to obtain suitable photographs. An approach was made to both the Federal Executive and to the Victorian Division. Very willing help was given by both and photographs and literature provided. The final layouts of cases and display boards was decided upon and equipment for the portable station in the foyer had been arranged.

On the evening of Friday 10th, a shower of equipment, amateurs, photographs and other display material descended on the library and with much rushing around and numerous cups of coffee, all was nearly ready for library opening time the next day.

Unknown to us the librarian and her staff had earlier prepared and printed a supply of handbills and these had been despatched to all schools, business houses and various community organisations throughout the City of Nunawading. In addition, several large posters had been displayed in the library itself.

Saturday morning and about an hour before opening time, club members arrived to set up the portable station in the foyer and to put the finishing touches to the static display. Finally all was ready and we waited to see what sort of response there would be from the public. It was enormous. The library was crowded all day and great interest was shown in the Static display and the station.

WHAT DID IT ALL ACHIEVE?

Constance and her staff were delighted at the public's response. Using their

measuring sticks of book issue and new enrolment, book issue was the third highest ever, and new enrolments doubled the Saturday norm. So obviously the involvement of the library in the exercise was worthwhile.

Constance has already spoken to other librarians around Melbourne and from what she tells me, the interest is very high. There doesn't appear to be any reason why the same interest shouldn't be evident in other parts of Australia.

From our point of view it was also a success. Although we did not have a means of objective measurement, we feel we succeeded in our main aim of showing the public what amateur radio was all about. Of course, we gained some new members, but it was not meant to be a recruiting exercise.

We've learnt from the exercise too. We should have had the station operating each evening the library was open. There is a need to display information on the QSO in progress. It is very hard to hear what the operator is saying so the audio on transmission needs to be broadcast on the extension speaker as well as the received audio.

As far as the static display went, we wouldn't do it very differently next time — and there will be a next time without doubt. The local newspaper printed a follow-up article as well as announcing the display in the issue in the week prior to Library Week. So we gained valuable publicity in the local press as well.

If any Club or group would like to know more about the details of mounting such a display, write or call the Club Secretary P.O. Box 87 Mitcham, Victoria, 3132, and we will be only too happy to assist in any way we can. ■



THESE MODELS DISPLAYED WERE BUILT BY NICK VK3ZND



PART OF STATIC DISPLAY WITH WALL PHOTO OF JOHN VK3JH



HOME BREW EQUIPMENT UNDER PROTECTIVE COVER — TO LOOK BUT NOT TOUCH



STATIC DISPLAY



WALL PHOTO OF MOBILE INSTALLATION AND DISPLAY OF POPULAR HF TRANSCEIVERS



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Export inquiries welcomed

| Filter Type | XF-9A | XF-9B | XF-9C | XF-9D | XF-9E | XF-9M | XF-9NB |
|---------------------------|-------------------------------|----------------|----------------|----------------|-----------------|----------------|----------------|
| Application | SSB- Transmit. Receive | SSB | AM | AM | FM | CW RTTY | CW RTTY |
| Number of Filter Crystals | 5 | 8 | 8 | 8 | 8 | 4 | 8 |
| Bandwidth (6dB down) | 2.5 kHz | 2.4 kHz | 3.75 kHz | 5.0 kHz | 12.0 kHz | 0.5 kHz | 0.5 kHz |
| Passband Ripple | < 1 dB | < 2 dB | < 2 dB | < 2 dB | < 2 dB | < 1 dB | < 0.5 dB |
| Insertion Loss | < 3 dB | < 3.5 dB | < 3.5 dB | < 3.5 dB | < 3.0 dB | < 5 dB | < 6.5 dB |
| Input-Output | Z ₁ Termination | 500 Ω 30 pF | 500 Ω 30 pF | 500 Ω 30 pF | 1200 Ω 30 pF | 500 Ω 30 pF | 500 Ω 30 pF |
| Shape Factor | (6:50 dB) 1.7 | (6:60 dB) 1.8 | (6:60 dB) 1.8 | (6:60 dB) 1.8 | (6:60 dB) 1.8 | (6:40 dB) 2.5 | (6:60 dB) 2.2 |
| Ultimate Attenuation | > 45 dB | > 100 dB | > 100 dB | > 100 dB | > 90 dB | > 90 dB | > 90 dB |
| Price | \$31.95 | \$45.45 | \$48.95 | \$48.95 | \$48.95 | \$34.25 | \$63.95 |

In order to simplify matching, the input and output of the filters comprise tuned differential transformers with the "common" connections internally connected to the metal case.

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|------------------------------|------------|--------|
| XF900 Carrier | 9000.0 kHz | \$3.80 |
| XF901 USB | 8998.5 kHz | \$3.80 |
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| XF903 BFO | 8999.0 kHz | \$3.80 |
| F05 Crystal Socket (HC 25/u) | 50 | |

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Matching FM Crystal

Discriminators for XF-9E

| Freq. Dev. | Slope | Price |
|------------|--------|--------------------|
| XD-9-01 | 5 kHz | -40 mV/kHz \$24.10 |
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| XD-9-03 | 12 kHz | -50 mV/kHz \$24.10 |

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MEASUREMENTS ON LINEAR AMPLIFIERS

AN AUDIO STAIRCASE GENERATOR

R. A. J. Reynolds VK3AAR

During and following the development of the VK3AAR Linear Amplifier (AR April, May and June '76) I became interested in measurements on sideband amplifiers, and in tuning methods. Whilst a lot of what was learned is of not much more than academic interest, several observations were made which are worth repeating. I don't for a minute suggest that these observations are "previously unknown", but from some of the sounds that you hear on the air, a lot of operators have forgotten.

The first observation concerns power and VSWR meters. Whilst the low cost parallel line SWR meters do provide a reading that is related to the real SWR, they are rather sensitive to voltage levels on the line. As a result, readings vary with position on the line and with the input power level. Link type meters that are really directional power meters, Sierra, Bird, Thruline, Collins etc., do not suffer from this problem to anywhere near the same extent. The unfortunate part of it is that

the lesser VSWR meter errs very much on the optimistic side. A feedline which showed 1:1 on a Hansen F55 showed 1.5:1 on a Bird Ham-Mate 4351. Introduction of some more cable between the load and the measuring point left the Bird meter much the same, but inspired the Hansen meter to read 1.3:1. Now we all know that for a lossless system, the VSWR is constant along the line, and 1.5:1 is probably the right figure. I am indebted to Tom, VK6MK, for drawing to my attention an article in CO for July 1975, which treats this subject in somewhat more detail.

The second observation concerns that wide subject of tuning, loading, output and linearity, all of which are interdependent. I touched on this subject briefly in the construction article mentioned above. Playing with a normal power amplifier with Pi-coupler output fitted with a power output meter and a monitor-scope or high frequency oscilloscope, will soon display the following observations.

If output coupling, or loading, and tuning are optimised for each of various input conditions, say single tone at full power, tenth power, 2-tone, and voice, it will be found that it is possible to tune towards maximum power on the meter, or

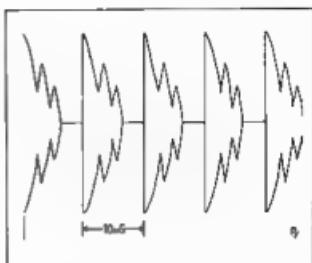


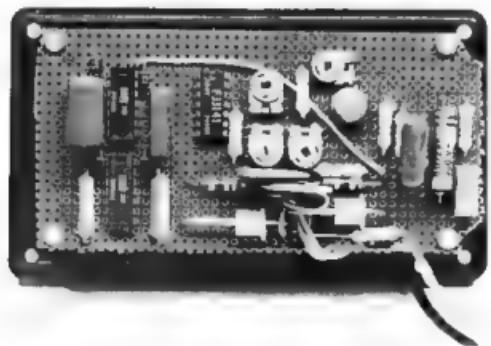
FIG. 1

maximum amplitude on the 'scope screen. A whole range of settings for the load and tune knobs will be discovered, and depending on the design of the amplifier, the comparisons will not necessarily be the same.

The problem is, under what conditions should an amplifier be adjusted, and to what parameters? Surely it will depend on the service for which the amplifier is to be used. RTTY or SSTV will have a fairly fixed duty cycle under sigma conditions, and a static output can be displayed on the scope, and the amplifier can be adjusted accordingly. For CW, single output level from a mechanical filter will provide a useable signal. But what do we do for voice? There is a wide peak to average energy ratio range to be found amongst operators' voices. We have all heard the "peaking" and "smooth" voices, to consider the extremes. Have a look at the waveform of your voice (at audio frequencies) on an oscilloscope, experiment with various sounds, and you will discover that there is considerable variation in the peak to average energy ratio within one voice, let alone from voice to voice. However, considering no distortion, a couple of things are obvious.

- (1) The ratio is nothing like single tone.
- (2) The ratio is nothing like 2-tone.

Yet these are the two most common



COMPONENT LAYOUT — AN AUDIO STAIRCASE GENERATOR

Photo: Ken Reynolds VK3CYC

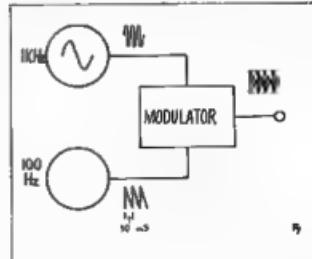


FIG. 2

DICK SMITH FOR ALL AMATEUR RADIO EQUIPMENT..



VHF EQUIPMENT

118 *Journal of Health Politics*

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|------------|--|----------|
| Cat D-2520 | Kenwood TS5200 transceiver, 80-10m, SSB/CW 240W + 12W operation. | \$879.00 |
| Cat D-5201 | Kenwood VFO-520 remote VFO for TS520 transceiver. | \$89.00 |
| Cat D-5202 | Kenwood SP 520 remote speaker for TS520 transceiver. (Also for TS820 see below) | \$34.00 |
| Cat D-2110 | Kenwood TS820 transceiver, 160-10m, SSB/CW FSK. | \$800.00 |
| Cat D-2111 | Kenwood VFO-520 remote VFO for TS820 transceiver. | \$800.00 |
| Cat D-2112 | Kenwood DGI digital display option for the TS820 transceiver. | \$137.00 |
| Cat D-2530 | Allis 210 transceiver, 80-10m, 200W input, SSB & CW | \$154.00 |
| Cat D-4306 | Hy-gain TH3M/C antenna, 3 d. beam 20, 15 & 10 m. 8.5dB gain, 1kW rating. | \$899.00 |
| Cat D-4308 | Hy-gain TH6XZ/C antenna, 6 d. beam, 20-15 & 10 m. 10.5dB gain, F/B ratio. | \$195.00 |
| Cat D-4301 | Hy-gain 16AW antenna, 24ft all band omnidirectional. | \$100.00 |
| Cat D-4300 | Hy-gain 101RQ antenna, 40, 20, 15 & 10 m vertical. | \$93.00 |
| Cat D-4705 | Ray 580N antenna, dipole for 80, 40, 20, 15 & 10m SWR 1.2 1.5, 2.5W rating. | \$140.00 |
| Cat D-4704 | Ray ALBD_400X antenna, loaded dipole for 80 & 40m 52 ohm. Max legal power. | \$140.00 |
| Cat D-4150 | Hunter 48TV antenna, 40-10m vertical. Metal mast, 21.5 ft high. | \$99.00 |
| Cat D-4152 | Hunter MO 1 mobi mast, suits all R/M series resonators. | \$99.00 |
| Cat D-4154 | Hunter MO 2 mobi mast, as above but bumper mounting. | \$25.00 |
| Cat D-4156 | Hustler RM80 resonator for 80m, ssu. to MC-1 or MO-2 feed line. | \$26.50 |
| Cat D-4158 | Hustler RM40 resonator for 40m | \$25.50 |
| Cat D-4160 | Hustler RM20 resonator for 20m | \$21.50 |
| Cat D-4162 | Hustler RM15 resonator for 15m | \$17.00 |
| Cat D-4164 | Hustler RM10 resonator for 11m | \$17.00 |
| Cat D-4166 | Hustler RM10 resonator for 10m | \$17.00 |
| Cat D-4170 | Hustler SEM2 antenna mount mobitel inc 1990 ad. stainless steel ball | \$22.50 |
| Cat D-4180 | Hustler M51 coax mount, includes 180° BNC and S-239 mast. Accepts PL259 plug. | \$6.50 |
| Cat D-7010 | Dummie load, 50 ohm, rated 1000W cont. (this would be far higher!) | \$18.75 |
| Cat D-7080 | Shivair 1006 TVI filter, low pass 30MHz, 52 ohm (not 50 ohm) max att 50dB | \$18.75 |
| Cat D-7190 | MC-700 antenna coupler, 25dB in/loss, 50 ohm, variable centering. | \$39.50 |
| Cat D-5500 | HKO 500 antenna coupler. Tuned any antenna for 1.1 SWR, 3.5 - 30MHz 52 ohm input | \$138.00 |
| Cat D-7200 | BK-DG transiting valve | \$8.55 |
| Cat D-7201 | BS-DG transmitting valve | \$8.25 |
| Cat D-7202 | B146 transmitting valve | \$9.00 |
| Cat D-7203 | BL-DG transmitting valve | \$12.00 |

NOVICE EQUIPMENT

| | | |
|-------------------|---|----------|
| Cat D 1700 | Mid and 1J-892 transceiver SSB/AM 11m, 23 channels, RF gain controls, etc | \$238.50 |
| Cat D 1436 | Mid and 13-882Z transceiver, AM, 11m, 23 channels, delta tone, and warning light | |
| Cat D 1430 | Mid and 13-820 transceiver 11m, AM for budget minded 23 channels 5W input | \$109.50 |
| Cat D 4142 | Mid 1 Helios antenna 11 meters, 50 ohm, 100' cable, 10' feed line, 10' rotator cable, 50' feed line | |
| Cat K 3134 | Horizon Transistor Kit. Build yourself 27MHz 500W 5GigaWatt | |

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|-------------------|---|---------|----------|
| Cat D 3100 | Kenwood TS-1000 transceiver, 2m, SSB, FM, CW & AM AC/DC, 22 channels. | Spec at | \$999.00 |
| Cat D-3007 | Multi 7.16m transceiver, 23 channel capcity from channel 1-2400 FM. | | \$189.00 |
| Cat D-3010 | Mtr 14000A transceiver SSB-CW FM 2m 144-148MHz in 10KHz steps. AC/DC. | | \$550.00 |
| Cat D-3050 | Kyotoete FM144-105X transceiver Synth, FM, 144-148 99MHz, 10W or 1W output. | | \$315.00 |
| Cat D-3500 | Kenwood TS-520 transceiver, 2m, SSB & CW 144-146 MHz. Capable of any mode trans. uses. | | \$239.00 |
| Cat D-3502 | Kenwood TV 502 transceiver, starts TS520 transceiver, output 144-148MHz. | | \$240.00 |
| Cat D-4000 | Icom IC202 transceiver, 2m SSB & CW Covers 144-145MHz comp portable. | | \$183.00 |
| Cat D-4620 | Green GA6070 antenna, 5/8 144MHz 1/4 50MHz. SIstal whip, 1.3m long. | | \$22.50 |
| Cat D-4200 | Hustler GH 144A colinear base antenna, shunt feed, SWR 1.2 1 standard 100watts rd. | | \$79.00 |
| Cat D-4600 | 3Y201 antenna, 3 elements beam for 144 MHz gain of 5dB. Knob down start for portable use. | | \$14.00 |
| Cat D-4610 | PA-25 antenna, 2m, 144MHz 2.5mtr whip start. PA259 on base. | | \$6.75 |
| Cat D-4611 | RAK 925 antenna, 5/8 144MHz, 1.5mtr 1.25m whip, PA 250 base. | | \$9.75 |
| Cat D-4650 | Antenna element bracket, takes 3/8" rd rod for making beam antennas, nsu, std type. | | \$0.45 |
| | NA5GDXL linear amplifier for BM band, 10W driver for 100W out, nbus 1 supply. | | \$376.00 |
| | NA144XL linear amp for 2m band, 10W driver for 100W out, nbus 1 supply. | | \$379.00 |
| Cat D-2807 | Dongguan 2m, 144MHz, 2m, FM, 11 channel plus VFO 145-152MHz 12V DC. | | \$99.50 |
| | Ham Prods ER6B PRF amp 1m or 6m. 200W gain for refl. 9-12V DC or 15mA. | | \$21.50 |
| Cat D-3802 | Ham Prods ERB2 PRF amplifier, 2m, same specs as above. | | \$21.50 |
| Cat D-3832 | Ham Prods EXC2 converter 2m, for 52.54 MHz IF output on 26-30MHz. | | \$27.50 |
| | Ham Prods EXC6 converter 8m for 144-145MHz IF output on 26-30MHz. | | |

SWI EQUIPMENT

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|------------|--|----------|
| Cat D-2850 | Yamaha Mu500 7" receiver 500WPM/300WFM Watley Prod. 240-12V 15W VHF sensitivity | \$725.00 |
| Cat D-2966 | Kenwood R-8666 receiver 170KHz 30MHz All mode (FM optional), band spread ANL | \$229.00 |
| Cat D-2801 | Drake SR-1 receiver 550WPM/30MHz VHF Dralex 3000 3" speaker 3 way network | \$300.00 |
| Cat D-4790 | RAX Intercom 1 V antenna 300WPM vhf Comp Assembled intended for DX work | \$18.75 |
| Cat D-4703 | RAX Intercom 3.10m wave dipole, 30-300 MHz | |

ACCESSORIES

| | | |
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| Lat D 7104 | Hi mound mors key. Doubles a tall post/poles and adj spring. Options for break-in keying. | \$19.75 |
| Cat O 1340 | Okies Bltr SWH2000 SWH + power meter 3 30MHz. Dpt 2 12W SWH 1.1. Infra red F55 SWR/power meter 3 - 30MHz. dupl. emp SWR. 100W. SWR | \$57.60 |
| Cat O 1360 | TRAK 1000. 100W. 52 ohms. 1/2" flggers. has T shape, uses central support for dpt on. T007. Antenna quick set. Infrared. Tens. the antenna off to avoid vandalism & damage. S5727. 100W. SWR. Receives both SSTV & amateur. 240V. AC operated. | \$29.50 |
| Cat D 2875 | Apolis 3 power mors. 100W. 52 ohms. 1/2" flggers. 3/4" flggers. 1/2" flggers. 1/2" flggers. 1/2" flggers. 1/2" flggers. | \$59.00 |
| Cat D 5294 | Apolis 3 power mors. 100W. 52 ohms. 1/2" flggers. 3/4" flggers. 1/2" flggers. | \$18.50 |

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 The Record Center, Griffith (621 5727)

"formal" tuning conditions. However, there are the "Haaarrroooow" tuners, and I am one of them, that try to simulate an average voice for long enough to observe the nearly static pattern on the 'scope and make appropriate adjustments to exciter load and tune, linear load and tune, and mike gain. Not very satisfactory, and not very polite either!

Some wit on air considered that I should build an electronic "AAR" (read "Ah") generator. It would say "Ah" as long as the batteries lasted, and would give a static approximation of a voice waveform for long enough to allow for considerable experiment. So I plugged a mike into the rig and observed that without compression and processing, my voice averaged the oscillosogram of fig 1, when viewed at the antenna. The repetition rate was about 100 Hz, in a rough triangle form. Such a waveform would be quite easy to generate. A tone of about 1 kHz modulated by a triangle wave would yield the required waveform as shown in fig 2. Modification of the 100 Hz triangle wave would tailor the generator to any particular voice.

So there we are, a waveform that will allow the operator to set his output controls so that the output is at a maximum with a waveform at the output that can be made as similar to the input as he likes.

Note that if the envelope frequency is too close to the modulating frequency, unwanted outputs will be developed that will change the character of the wave.

All the same the method is useable. However, there are still problems in interpreting the output wave form. The shape has still to be compared with a picture of

the original, in much the same way that a 2-tone output has to be judged. Whilst gross distortion is obvious, small deviations from the ideal are not so evident.

At this stage I borrowed a page from the testing methods used in television circuits. One very effective method of measuring linearity in television is to measure the height of successive steps in a staircase waveform. In particular, a modulated staircase is used to examine the performance of a video link at the colour subcarrier frequency. So why not a version at audio frequencies? The height of successive steps could be examined at the output of the transmitter, and the effect of each control in the system can be examined in turn. It is very obvious when the top step begins to crush, and it is very obvious when the transmitter output, on the top step, is at a maximum.

The advantages of using a test signal of this type are beginning to mount. The waveform is fairly similar to that of a voice, deviations from good linearity are fairly obvious, and the testing power level is at 25% of the PEP value. At this level there is little danger of anything overheating if the system is fairly well tuned.

The generator that I built is described here.

The staircase repetition rate and the modulating frequency were not more than an educated guess, 33 and 1700 Hz being chosen so as to have 10 cycles of audio on each step of 5 steps. 1700 Hz was chosen as being somewhat on the high side of the middle of the audio band of most transmitters. The block diagram of fig 3 shows the principle of operation. The non-symmetrical square wave 170 Hz oscil-

lator "A" is counted by the modulo-5 counter "B" whose outputs are weighted into a low resistance by network "C" to give the staircase as shown. This signal is used to modulate the output of the 1700 Hz oscillator "D" in the balanced modulator "E". The output of the modulator is put through a very simple RC low-pass filter "F" to produce the required waveform.

The detailed circuit diagram is shown in fig 4 and is quite straightforward. A total of 4 integrated circuits are used, TTL for the oscillators and counter, and the general purpose C 1496 for the modulator. It all fits on a piece of matrix board, 10 by 5 cm. The 4 controls are set as follows: RV 1, 2, 3 are set to obtain as close to even steps as possible at the input to the modulator, with a total amplitude of 150 mV. It will not be possible with this circuit to obtain exactly even steps, but the available result is quite acceptable.

RV4 is set to obtain ~ 8 volts on pin 6 of the MC1496. A slight adjustment of RV4 may be necessary to obtain a symmetrical output when viewed on an oscilloscope. It might also be necessary to readjust RV1, 2, 3 to obtain equal steps in the modulated steps. The output of the prototype had a peak to peak amplitude on the top step of 1 volt. The power was provided from a -9 , 0 , $+8$ volt supply. A couple of 5.1 volt Zener diodes provided regulated rails for the TTL chips and the reference potential. Make sure that the 1700 Hz modulating frequency is within the audio range of the transmitter, as a 4 kHz signal for example just won't get through most filters used in sideband service.

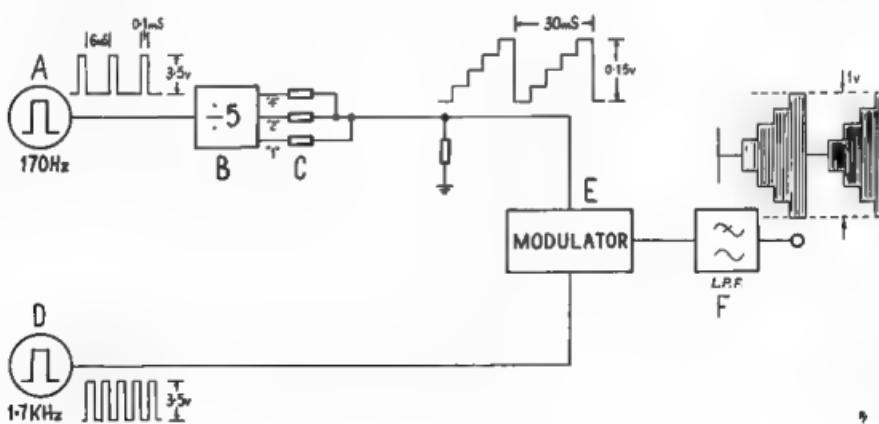
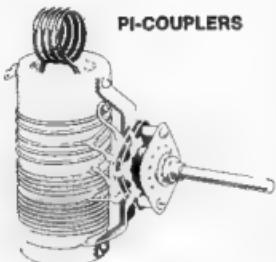


FIGURE 3



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| 2.06 | 8 | 8 | 3 | No. 3006 |
| 2.16 | 1/2 | 16 | 3 | No. 3007 |
| 3.08 | 8 | 8 | 3 | No. 3010 |
| 3.16 | 1/2 | 16 | 3 | No. 3011 |
| 4.08 | 1 | 16 | 3 | No. 3014 |
| 4.16 | 1 | 16 | 3 | No. 3015 |
| 5.08 | 1 1/2 | 16 | 4 | No. 3018 |
| 5.16 | 1 1/2 | 16 | 4 | No. 3019 |
| 8.10 | 2 | 10 | 4 | No. 3807 |

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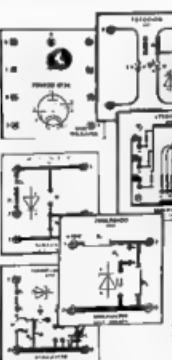
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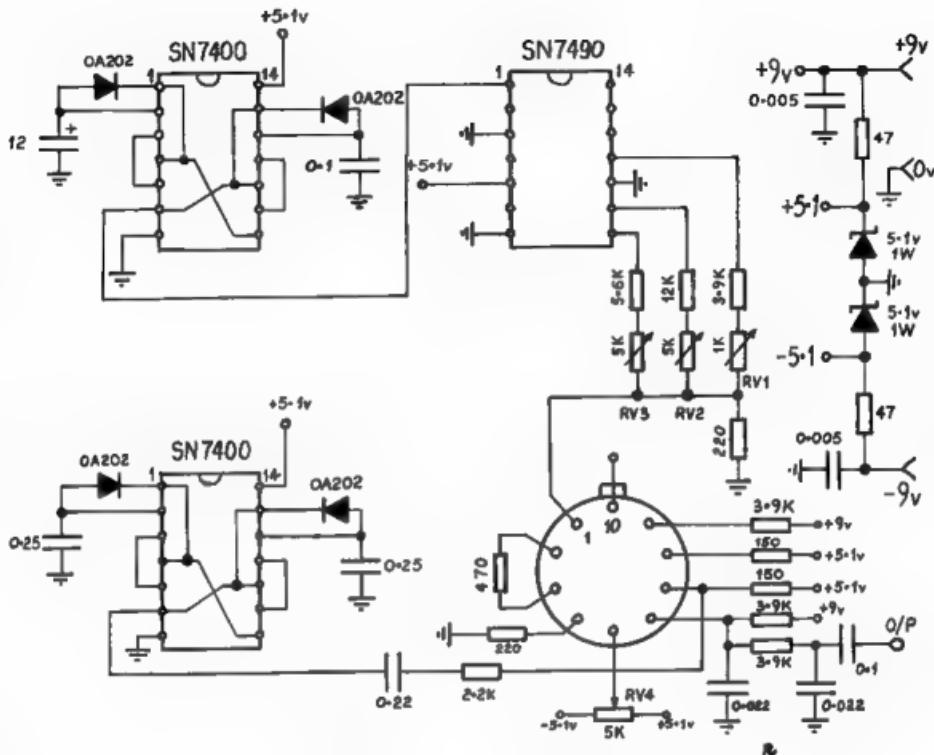


FIGURE 4

My transceiver uses a tip-ring-sleeve type of mike connector, so I fitted such a plug to the generator, with the tip connected to earth so that the Tx is operated whenever the unit is plugged in.

The circuit of fig 4 was theoretically derived, and when I put it together, it worked much as I expected and further development was not necessary. Thus there may well be some details that could be further developed or varied to suit individual tastes.

In use, without speech processing, the oscillogram at the output of the transmitter will be similar to that at the mike input, but only if the system is linear. The 1700 Hz modulation will of course appear as 14 MHz odd on the 20 metre band for

example. Inadequate filtering at the output of the generator results in a small amount of ripple on each step, although it is not a nuisance. So, set the load and tune controls for maximum amplitude step, with even steps at the same time, setting the mike again so as not to cause overload. If you use an in-line power meter, note the reading and multiply by 4 to obtain the PEP output on equivalent voice peaks. You may well get a surprise when you compare it with the result of a 2-tone test. The chances are that the PEP output on equivalent voice peaks is higher than the 2-tone PEP by 20 to 40% since the average system loading on power supplies is lower. Unplug the star-step and plug in a mike, and adjust the mike gain for voice peaks

of about the same level as the level on the top step as viewed on the 'scope, and you will have an optimised signal that is one of the cleaner signals on the band.

The use of the generator does not end here. It may be used to observe the operation of speech processors, which, after a little trial and error, may be used to modify the linearity of the system in an ordered way without overloading the system, hopefully. A linearity fault in a system may be examined by observing the linearity at intermediate points with the aid of a suitable probe. At VK3AAR, this unit has certainly replaced the 2-tone generator, and may well disappear inside the excited to operate in the "tune" position.



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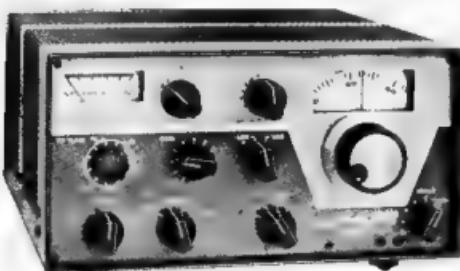
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TELETYPE MESSAGE AND KEYBOARD GENERATORS

H. G. Kociemski VK4ZAP
81 Spring Street, West End,
Brisbane, Qld., 4101

Expensive and complex mechanical GONKULATORS are now defunct, or nearly so. This design was originally intended to replace the transmit section of the mechanical teleprinter, and indeed it could do so if a keyboard was installed at the input to the code converter. However, problems may be encountered with contact bounce.

MESSAGE GENERATOR:

Basically, the device is a 5 unit code generator which can generate a sequential message e.g. 'VK F/S 2 L/S ZHK SPACE TEST C/R L/F' and repeat, in standard teletype form complete with start and stop pulses.

The output of the device is standard TTL logic and can be used to drive an FSK or AFSK transmitter, though this has not been tried yet.

The unit functions very well, giving virtually zero distortion 20 mS pulses (variable) in serial form. Commercial practice dictated the use of 30 mS stop pulses. The stop pulses here are 20 mS (due to ease of design), however, it will generally be agreed that this is inconsequential.

I have tested the device on OTCs standard mechanical 60 and 75 baud teleprinters via a mercury wetted polarized relay and double current to single current converter.

Operation starts at the Automatic Sequence Generator which is driven by a (variable speed) clock. This sets the rate at which letters are printed.

The binary counter sequentially addresses the 1 of 16 decoder causing a sequential logic zero on each of the output lines. Hence the output of the transistors driver goes high and forward biases the respective diode encoder

Hence the 5 unit code is generated in parallel form, and is displayed on the LEDs.

The 5 input NOR gate senses the presence of the 5 unit code and triggers the monostable multivibrator which "loads" the shift register within 3 microseconds. When the monostable returns high, the shift register is already loaded and immediately clocks the data, including the fixed start and stop bits, out to line.

The serial data is now a 7 unit code and could be used to drive a teleprinter

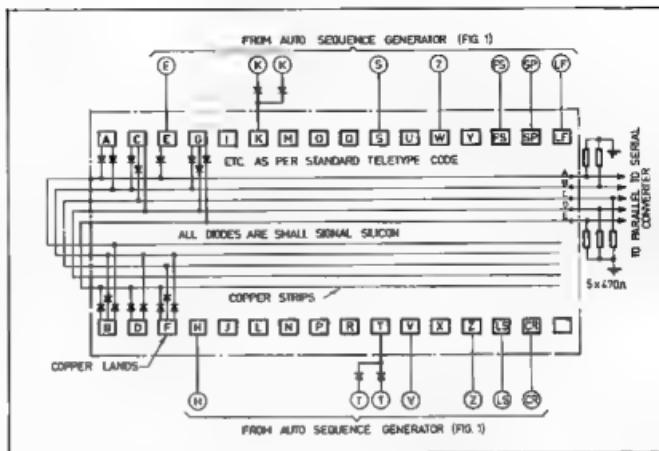


FIG. 1. DIODE ENCODER, PRACTICAL CONSTRUCTION

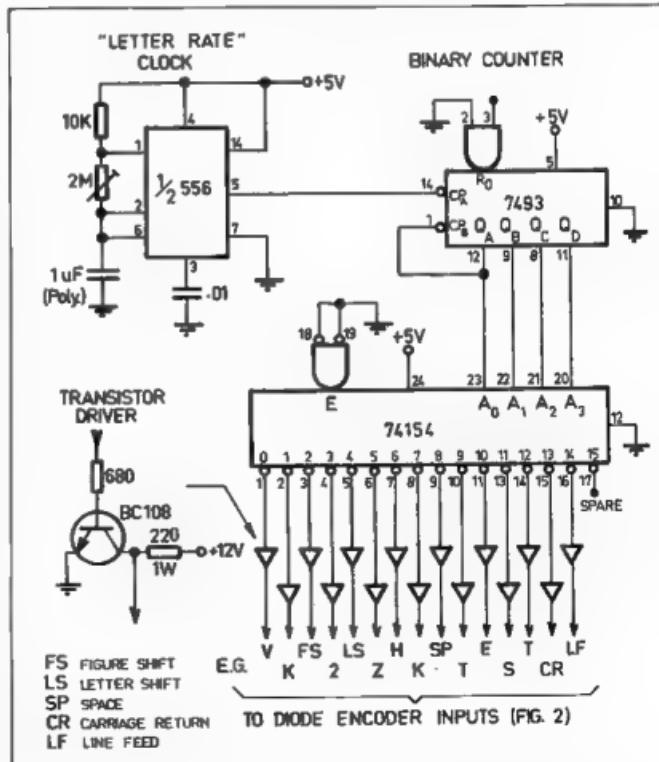


FIG. 2. AUTOMATIC SEQUENCE GENERATOR



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Max. output at 1200 MHz 14 W

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The double NOT is necessary to keep the input of the 7430 from floating to a 1. (This input was originally tied directly to line 4 and caused a permanent 1 there.)

The 4.7 μ F capacitor was used to remove very fast transient pulses which tended to interfere with counter operation when certain keys were pressed.

(Note: Each counter should have a bypass capacitor at the supply pins for best results. The popular 7490 decade counter could also be used with similar decoding. [Topic 5-1](#).)

КЕУНОДО ГЕНЕРАТОР

KEYBOARD GENERATOR
As a companion to the RTTY message generator, this keyboard would make a valuable addition to the shack.

Further development of the Message Generator has produced a complete solid state teleprinter transmit unit, thanks to the recent availability of a good quality, low cost keyboard from Melbourne.

2 ICs and associated components are required to transform the original "fixed message" generator to a keyboard unit.

The big problem was elimination of false triggering due to contact noise and bounce in the keyboard.

Monostable M1 and M2, take care of this as can be seen from Fig 4. The monostables, as wired, only triggers on negative going edges.

With this simple but effective system, a criterion must be observed for correct code generation. The typing action must be carried out within the period of operation of monostable M1 i.e. less than 250 ms approximately (normal typing action), otherwise a false trigger will occur, producing no an "all spaces" condition.

Even though the circuit has been modified, the fixed message facility still performs perfectly, and that part of the circuit is built on a plug-in board so that it is quite easy to change from keyboard to fixed message.

FOOTNOTE

The circuits shown here could probably be simplified somewhat to reduce component count and power consumption, but obviously works "as is".

Technical Editor ■

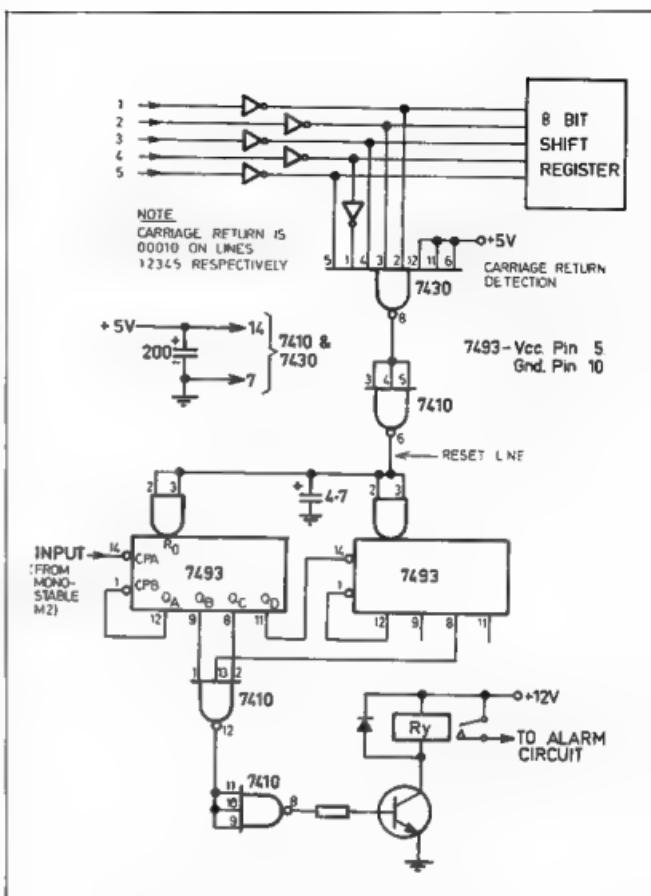


FIG. 6. CARRIAGE RETURN ALARM CIRCUIT.

A PERSONAL VIEW OF THE METRE WAVE SCENE IN THE U.K. NOW

Any expatriate amateur radio operator returning to his native UK after a few years in, say, VK or ZL would hardly believe his ears as he sampled the 2m or the 432 MHz bands today.

Very much a thing of the past, he would find, is the old geographical band planning

present in its place is band planning by mode. Old familiar beacon signals appear in new places on the dial. And new unfamiliar repeater signals are now to be heard popping up almost 24 hours a day.

Putting his sensations into one sentence, he would probably conclude that metre wave development in Britain was proceeding at a dynamic rate unsurpassed in any other area of amateur radio activity. He would be right, even if he looked at

By Jack Hurn, G5UHM

*RSGB VHF Awards Manager, member of RSGB VHF Committee, conductor of 'Four Metres and Down' column in Radio Communication from 1968 to 1974, member RSGB Council 1952-59, and Vice President of RSGB

MHz and 70 cm bands. He would be even more right if he took account of the rest of them, from 70 MHz right up to 74 GHz.

It has not always been so. In the fifties it seemed as though the metre wave scene in the U.K. was frozen into the pattern it took up immediately after the war, when crystal controlled converters into main station receivers as IF strips, and simple amplitude modulated transmitters were the norm. The 2 m and 70 cm bands were sub-

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zones related to frequency; if you wanted to work a station in Scotland or the north of England you turned your beam antenna that way and tuned only a restricted portion of the band in which Scottish and northern stations congregated. This obviated the chore of having to tune the whole of 144-146 or 432-434 MHz, which are the British communication allocations.

First indications that this pattern was to be unfrozen came when the F3 frequency modulation mode gathered some strength, followed later by the appearance of single sideband. At first these modes were regarded as disturbing to the ordered staticness of the 2 m and 70 cm bands to the extent that they were confined to spot frequencies, 144.48 MHz for FM and 145.41 for esoteric A3J, the sport of kings, electronic kings at least and outside the competence of the drill-and-hacksaw kitchen table enthusiast who delighted in making things work for himself but not anything quite so fraught and frightening as single sideband at VHF.

Today it seems unbelievable that such a state of affairs existed little more than half a dozen years back. Frequency modulation is now the standard mode of voice communication not only in Britain but in VHF circles in most of the European countries that make up IARU Region 1. One should qualify this statement by adding "voce communication for local contacts", for it is closely matched in popularity by A3J for DX working. Each is tidily compartmented, FM above 145 MHz and SSB below 144.5 MHz. The "bit in the middle" is occupied by a mixture of modes from slow scan teletext, local nets on FM, plus the last vestiges of amplitude modulated telephony that still remain.

The bottom 150 kHz of the British 4 m, 2 m and 70 cm bands is reserved for CW, still the best-ever mode for guaranteeing a sustained contact when all else fails and when even SSB, reading nil on the S-meter, at last peters out. To some, telegraphy remains the last bastion of true amateur radio, a romantic notion not shared by many yet the fact remains that it is the last bastion of something else, and that is the ability to demonstrate operating skill. Where no skill is called for to actuate a press-to-talk button on a phone transmitter, a good deal of expertise is needed to tap through the finger tips via a Morse key, making it up in the head as you go along to emerge in the brain of the person at the other end as pure conversation, impeccably phrased and spelt.

COMMUNICATION BY PROXY

From this image of direct communication via the A1 mode nothing could be in greater contrast, even many VHF operators, than the concept of communication via repeater. Since the advent five years ago of the pioneer 145 MHz repeater developed by the radio amateurs at the Pye establishment and installed a dozen miles south of the city of Cambridge, repeaters have proliferated throughout the British Isles to an extent that saturation point has virtually been reached in respect of co-channel

repeater spacing at 100-mile intervals, and interest is now being turned on the development of a parallel chain in 70 cm. The 2 m chain has 600 kHz spacing between input and output frequencies, the 70 cm chain 1600 kHz.

Two primary causes of this burgeoning of the repeater ethic are, first the enormous increase in mobile operation in the UK, where one fifth of the 20,000 amateur licensees also hold "Stroke mobile" permits (and most of them use VHF), and secondly the widespread availability of extra transceivers readily adaptable to the amateur bands, and of Japanese "black boxes" that all too readily earn their owners the appellation of "appliance operators" with not the slightest effect on the huge sale of such devices.

Few developments on the metre wave scene in the UK have been so controversial as the repeater one. Extreme positions are taken up, expressed in such statements as "This isn't real amateur radio" to, on the other hand, "This repeater business is the ultimate in ease of communication". Both are right — up to a point! What is incontrovertible is the fact that repeaters have immensely extended the range of vehicle to vehicle equipments and probably made such communication safer than it was in the simplex days of one hand on the steering wheel and the other on the rig. And anyway, as one correspondent to the RSGB's Radio Communication remarked "If you don't like repeaters you don't have to use them. Metre waves represent a house of many mansions, and if you don't like one door try another".

MANY MANSIONS

A look now through some of those other doors. One of them is labelled 70 MHz. It is the nearest thing to the American 6 m band which the British possess, and is peculiar to the UK. Strangely, it is denied to the Class B licensees with their G8-plus-3 call signs and no Morse requirement. This at once reduces its population to those full-time owners who find it a fascinating band capable of yielding DX well beyond the range to be expected on 2 m. But it is, one must confess, a minority interest.

So also are the microwaves. But here, as with 4 m, amateur curiosity impels exploration, helped along by the opportunity to earn special operating awards which the RSGB offer for long distance coverage on such bands either from home locations or from contest operation. Particularly on the microwaves, no "frozen into accepted patterns" is evident: antenna dishes once de rigueur become supplanted by Yagis, klystrons by Gunn diodes (or vice versa).

Of other mansions, such as Oscar or high definition television, space prevents one from doing more than to record that they exist, enjoy an enthusiastic minority following and are productive of some surprising results.

HANDS ON TILLERS

Lest it be thought that all this dynamic activity is random, self-generating or spon-

taneous, one had better emphasise that most of it is inspired, directed and generally assisted by the national society, the RSGB, operating through such bodies as the VHF Committee, the VHF Contest Committee, the Repeater Working Group and similar voluntary bodies that skilfully hold tillers on to true courses where in their absence there might well be some wild — perhaps dangerous — navigation.

For example, all beacons are an RSGB responsibility. So are the repeaters. The licences for all of them are vested in the RSGB by the UK amateur licensing authority.

Internationally, the RSGB works in close co-operation with sister societies on the mainland of Europe, or what is known as IARU Region 1, mentioned earlier. The dates and rules of metre wave contests are harmonised in this way. Farther ahead lies the watershed of the 1979 World Telecommunications Conference, and the hard look it will doubtless give to amateur frequency allocations. Preparations to surmount it are well advanced in RSGB, and the metre wave content of those preparations is a very sizeable one. ■

THE FACE BEHIND THE MICROPHONE

Pictured is Graham Clements VK3TK.

Graham is currently the chairman of the VK3 division broadcast committee.

He first became interested in radio at the age of 12 when he began SWLing to commercial stations. He joined YRCS when he was 14 and progressed to senior level in approximately 18 months.

His limited licence (VK3ZLT) was obtained in 1972 and he became active mostly on 2MX FM and AM. In mid 1973 he joined the Broadcast committee, and obtained his full call in 1974.

He has been active on 40 and 20 DXing, and has now branched out to ATV which he thoroughly recommends to anyone who is looking for something extra-exciting.

Graham is presently studying for a degree in Communications Eng (near 3rd year) at RMIT.

We wish him well in his ventures.



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req'd)

HELL CAT 9, 50° Marine (no ground plane

req'd)

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in Hope-10R)

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| HC-500A Tokyo Hy-power labs inc 160mx 500w PEP | \$94.00 |
| HC-2500 Tokyo Hy-power pep trans. Trans-match 2.5 kw PEP | \$249.00 |

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THE DEATH OF AMATEUR RADIO AS A HOBBY

Andrew Davis VK1DA

Licensed 11 years, Member WIA, Life Member ARRL

The recent reports giving incredible statistics of the imports of CB radios to the USA (for example, over half the value of air freight shipments being CB gear) were rather mind-boggling.

I remember being surprised, too, on reading that "point-of-sale-licensing" is now being practised in the U.S.A. This is an elegant phrase meaning that you get your licence and call sign from the dealer when you buy your gear.

But the latest report is that all new cars coming out of Detroit will soon be equipped with a combination AM/FM stereo/CB transceiver radio as standard. Just think! Every new car with CB in it! Well, that did it! I now reckon it's only a matter of time before the craze really spreads to Australia. Sure, 27 MHz will be a mess, like it is in the States, but the "citizens" don't care about spectrum pollution any more than they care about other forms of pollution. The 27 MHz pirates currently screaming about "rights to communicate" will turn pale at the interference on the band they wanted to be free to use. But what will amateur's reactions to all this be?

Some will stick their heads into the proverbial sand and pretend it is not happening. Others will react with righteous indignation and others with relief. Some won't notice and won't care when they find out.

I guess some will castigate me for putting these ideas into print. After all, it's tempting fate to speak of unpleasant things, let alone put them into print. This attitude is one of the basic problems faced today by amateur radio, and in Australia, the WIA.

In his report, Bob Arnold stated that "the Institute's . . . policies must be geared to the closing decades of the 20th Century so far as events can be predicted". In recommending a change of name for the WIA he added that "the word 'Institute' is somewhat Victorian", so he feels that a change in name would help the members and the WIA to update to today and handle tomorrow better.

But he felt that the individual amateur and member was generally lacking something, "one of the interesting facets of life which has come out of the investigation is

the attitude of the amateur himself . . . Many comments . . . indicated a lack of understanding of various functions of the Institute . . . (one) hears the comment 'I do not have time to read AR or listen to the broadcast' but yet these people will talk in monosyllables for an interminable period, wasting many hours, a few minutes of which could be devoted to an understanding of the Institute. Perhaps this is part of our way of life today . . ."

In Future Shock, Alvin Toffler says that "as the rate of change in society speeds up, more and more older people feel the difference keenly. They . . . become drop-outs, withdrawing into a private environment, cutting off as many contacts as possible with the fast-moving outside world, and finally, vegetating until death".

I'm sure that this concept extends to organisations, too. Thus it is that the possible fate of the individual amateur, the WIA and the hobby itself is vegetation until death.

Our hobby could die of future shock. In order to cope with the future, the WIA must become more flexible, its members must open their eyes, not drop-out. Subjects like CB, the use of the term 'radio ham', and the progressive commercialisation of our hobby cannot be ignored. They must be faced realistically, the emotional reaction must be filtered out.

A WIA Federal Council resolved to ban the use of the term "radio ham". Yet how are we known to the general public? You give the answer.

Facing CB realistically, let's see what is in it for us. Some CBers will never tire of endless non-conversations (uncomfortably similar to those conducted by many amateurs), but others will be drawn to the technical side of the hobby and will become valuable members of the amateur body. If 5% of CBers were drawn to amateur radio, our numbers could double within a few years. Check the figures yourself.

Where else will the much-needed infusion of youth and enthusiasm come from?

What would you find more exciting, as a person wanting to "talk on the radio", CB or amateur radio? The amateur bands are full of endless monologues, Morse,

broadcast stations etc. and few of the conversations one hears are technical in nature; few of the contacts are other than "skeds". DX activity on some bands is dominated by a few, who take offence if any other station attempts to contact their DX station . . . On the other hand, many CBers are interested in fiddling with their equipment and antennas to improve signals etc. Many, too, are young and enthusiastic about their hobby. The illegal nature of "CB" in Australia only adds to the attraction. I suggest that amateur radio must often lose to CB even when the person concerned is interested in radio as a technical/communications hobby. Can we really be surprised?

Take a realistic look at the International scene and amateur radio's chances at WARC in Geneva, 1979.

Far from gaining HF bands, we run a serious risk of losing HF and VHF bands or at least parts of them. 148-148 MHz is in danger, 420-450 even greater danger. So you're not VHF type? Never mind, you need not be smug. If possession was nine-tenths of ownership, you wouldn't have much left of 3.5, 7 or 14 MHz. By all means keep the 80 kHz at 1.8 MHz!

But it is certain that the events of WARC 1975 will pass almost unnoticed by many amateurs. Unnoticed until they call CQ on a band no longer allocated to amateurs. (I suspect that amateur radio was declared illegal tomorrow, most skeds, DX activity, 2m FM contacts including repeaters would continue regardless for years. We would all be pirates, but amateurs now regard the use of "their" bands as a right rather than a privilege: does this sound familiar?)

Do you think your hobby is worth saving? I do, but scores of countries in the world do not (watch them vote in 1979).

To save it, we need to put on a new face and start thinking differently behind our faces.

Bob Arnold reckons the WIA needs a new face. Chances are, you haven't even read his report in April AR, so you couldn't be one of the uncaring ones.

Start taking Amateur Radio seriously. Or you may become a pirate.

— Reprinted from "Forward Bias", Sept. 1976.

AMATEUR RADIO AT EASTLAND

Graeme Scott VK3ZR

During the week July 26-31, the Box Hill Technical College ran a display of its various trade departments to show the public what courses are offered at the college. Parents of prospective students were able to speak to teachers and discuss the future careers of their sons and daughters.

The college amateur radio station VK3BHT was operated portable in the shopping centre at Ringwood. As part of the college's facilities are devoted to teaching radio apprentices and technicians (evening classes), and of course, the form 5 Youth Radio Club Scheme, radio had to be represented.

On Monday 26th, I took my 14AVQ vertical, which covers 40, 20, 15 and 10 metres and installed it on the roof of the Eastland Shopping Centre. For 2 metre FM, I borrowed a Ringo from Vcom, and a power supply for the IC22a, and with the aid of some borrowed coax from Ball Electronics, we had our antenna system installed.

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The FT200, and the IC22a were set up on the desk and, with an appropriate display of QSL cards and posters, we were on the air.

It wasn't long before we were informed that our SSB transmissions on 7, 14, 21 and 28 MHz were disturbing colour TV reception of the Olympic Games! Oh Boy! what to do?

Andy VK3UJ, came to the rescue on Tuesday with a low pass coax filter. This however, did nothing to reduce the TVI. Later in the day, Andy tried his Uniden 2020 and the TVI was just as bad. We concluded that the TV antenna and our 14AVQ were too close; even though the TV antenna was line of sight to the Mt. Dandenong transmitters, just a few miles east of the centre. There was just plain overloading occurring in the Brash's TV store antenna system.

I then decided that a high pass filter was the only way we could get rid of the TVI. The form of the TVI was evidenced by sound bars completely wiping out the picture, lack of sync, and the reversion of monochrome by almost all the receivers, which, incidentally, were of diverse brands - local and imported.

The ARRL handbook was consulted and a high pass filter was constructed in a box made from a P.C. board laminate. I established good PR with the store manager, who was delighted that I was trying to solve the problem, as sales were being affected! (We were affecting cassette re-

on the Olympics etc. I felt that I'd achieved something, and proceeded to log many contacts TVI-free.

Thanks to the excellent response and co-operation of amateurs contacted, I was able to put a number of members of the public onto the SSB and FM microphones and they were able to see Amateur Radio in action. The young boys, especially enjoyed talking to someone at the other end of the microphone.

On Saturday 31st, many VK2's and VK5's were contacted on 7 MHz. My special thanks to Ern VK2AJ whose QSO I interrupted to obtain an interstate contact. Once established, we were called by VK5's, VK2's, VK3's and VK7's. Rob VK2AGK was worked 5-9-QSB mobile in Newcastle using a Uniden and a Hjaltier whip. You certainly were getting out well Rob!

Later on in the morning, VK3AMR at Monash University was contacted. The University's open day was on and an FT200 was being used with a G5RV to show off Amateur Radio at the Uni.

Overall I feel the display was a great success and it was gratifying to see so much interest in Amateur Radio. A few CBers were put on the right track, and might be doing the NACCP or AOCPP course at VK3BHT in the evenings in 1977.

WIA membership forms and amateur licence details were taken by many people, so hopefully the whole exercise has been, or will be, quite fruitful. ■



JULIE, XYL OF GRAEME VK3ZR
OPERATING THE STATION

coders etc. too, but that is another matter. Ultimately, the Olympics had priority.

I had no time to dip the coils in the filter, but just installed it in series with the coax to the store's distribution amplifier which was apparently overloading on our HF signals. Once connected, the filter degraded the TV signal slightly, so I tried spreading the turns on the coils, and achieved satisfactory pictures. Once that was achieved, I told the store manager that I'd start transmitting and would be watching for any further trouble.

As it happened, I could see some TV sets from my operating position and 7 MHz and 14 MHz signals had no effect,

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REVIEW OF

THE YAESU

FT301D

TRANSCEIVER

It seems that the future is getting closer all the time. The Yaesu FT301D is a case in point. Contained in a package only 280 mm wide, 125 mm high, and 370 mm deep is a fully solid state, 200 watt input, all band HF transceiver with just about every feature that the imagination could conjure up.

However, back to the beginning. The advent of fully solid state HF transceivers for the amateur market has been slow and surprisingly from the United States rather than from Japan. Prior to the new Yaesu FT301 series there have been at least four different American models available in this country over the last year or two. One can only guess the reasons for the rather late appearance of the Japanese equivalent.

The Yaesu Misen Co. are to be congratulated on their new product which will undoubtedly set the pace for other manufacturers to follow.

The FT301 series consists of four models: either 20 or 200 watts input, with or without digital readout. The model to be reviewed has the full 200 watts input and the digital readout. Certain other features are optional and these will be itemised later.

TECHNICAL FEATURES

The FT301D transceiver covers all the HF amateur bands in 500 kHz segments. These are 1.5 to 2.0, 3.5 to 4.0, 7.0 to 7.5, 14.0 to 14.5, 21.0 to 21.5, 27.0 to 27.5 and 28.0 to 30.0 MHz in four segments. Operation is provided for SSB with upper or lower sideband, CW, FSK, and AM. The transceiver is supplied with the normal 24 kHz filter for SSB operation but it is possible to install both a 600 Hz filter for CW and a 6 kHz filter for double sideband AM operation. As far as is known this is the first time that a full bandwidth AM filter has been available in an HF transceiver.

Following in the tradition of the FT101E an RF speech processor is included. Another first in HF rigs of this type is a receiver notch rejection filter. Naturally all the other normal features that one expects are there. These include, noise blanker calibrator, clarifier for receive or both transmit and receive, VOX, external VFO switching and fixed channel operation with eleven crystal positions provided. Three different AGC time constants are switch selected from the front



panel and allow fast, medium, and slow decay times.

In addition to the band coverage mentioned above, a bandswitch position is allocated for WWV reception on 5 MHz. This is slightly different to normal in two aspects; firstly in the frequency chosen, and secondly that it is fixed tuned to exactly 5 MHz, with an internal trimmer to set the actual zero beat point.

The transceiver requires a source voltage of 13.5 and is therefore all ready for mobile or portable operation from a normal car battery. For home station use the matching FP301 AC power supply is recommended. This unit is capable of delivering 13.5 volts at 25 amps with excellent regulation.

As the photo of the FT301 shows, it bears a strong resemblance to the FT221 two metre transceiver reviewed in the June issue of this magazine. It does indeed share the same front panel and cabinet as well as the plug-in printed board internal layout.

Another design feature of the FT301D is the broadband transmitter driver and output stages. This eliminates the need for the usual final tuning and loading controls. However, in common with all circuits of this type, a close 50 ohm match is required for the output stage to deliver maximum power. Perhaps to satisfy doubts that the receive front end is really peaked up for maximum signal a 'Drive' control calibrated for each amateur band is brought out to the front panel. This operates a permeability system similar to that in the FT101 series transceivers and tunes the receiver front end and the low level transmitter stages. There is no doubt, it's a good feeling to peak this up and know everything is on the nose.

THE FT301D CIRCUIT

After looking at the technical features, we will now see just how it's all done. The FT301D is of single conversion design. With an IF frequency of 9 MHz the conversion scheme is rather like the FT200. The FT101 on the other hand is a double conversion design with a second IF and sideband filter at 3180 kHz. The receiver front end of the 301D uses the now almost standard 3SK40M dual gate FET as the RF amplifier and also as the first mixer. The IF amplifier section starts off with a ± 10 kHz monolithic filter which

helps to improve the receiver front end performance in such aspects as cross modulation. This is followed by two stages of amplification before the main filter section is reached. As mentioned before, three filters can be installed and these are diode switched along with the function switch. Unfortunately, the FSK position on the function switch is not explained in the instruction book and it is not clear whether an RTTY filter is available, and if it can be installed. Our review sample had only the standard SSB filter installed and this was in circuit in all positions of the function switch.

The output of the VFO unit is premixed with the output of the heterodyne oscillator to produce the transmit frequency, or to convert the input frequency to the 9 MHz IF, on all bands except on 80 metres where the 5.5 MHz VFO is subtracted directly from the 9 MHz IF to produce 3.5 MHz. The crystal frequencies in the heterodyne oscillator range from 16 MHz for the 160 metre band to 44 MHz for the 2.95 MHz segment of the 10 metre band. An interesting feature of the audio section of the receiver is the inclusion of a top cut filter with a sharp cut-off above 2.6 kHz. This provides very clean audio with a complete absence of high frequency hiss.

The rejection filter works very much like the old single crystal filter common in communications receivers of the early post war years. A single crystal of about 9 MHz nominal frequency is series tuned with a small variable capacitor to vary its resonant point across the band pass of the transceiver. In all a very simple but effective idea. It's a wonder someone has not thought of it before. The idea should be adaptable to most existing transceivers.

A separate AM detector is provided, however it was unfortunate that the optional AM filter was not installed so that we could check out the AM performance.

While the transmitter circuitry is fairly conventional a few interesting design points are worthy of mention. The RF processor is designed to produce similar results to the one installed in the Yaesu FT101E. It is, however, operated at the 9 MHz IF frequency of the FT301D rather than 2180 kHz. A second 9 MHz filter is

included to remove the distortion products produced in the clipping process.

The 301D output stages consist of two broadband amplifiers in cascade. The output of the 10 watt driver stage is connected via a BNC coax fitting to the 100 watt final stage which is attached to the rear of the cabinet as a separate unit. The output of the final is routed back into the transceiver proper via a second BNC connector to the output filter section. If low power operation, or drive an external transverter is required, it is simply a matter of taking output from the appropriate BNC socket.

The digital display as fitted to the FT301D is set up to read the VFO frequency. The 5.0 to 5.5 MHz of the VFO is converted to 13.0 to 13.5 MHz which is the frequency at which the display counts. The MHz prefix for each band is produced by a diode matrix switched by the band switch. Although the display reads to 100Hz points the counter itself reads down to the 10 Hz points. This is to eliminate flicker which would otherwise occur on the last digit.

Front panel indicator lights set between the dial readout and the 'S' meter show clarifier operation, and VFO or fixed channel selection.

THE FP301 POWER SUPPLY

This supply will be available in two versions. The FP301D also includes an LED digital clock which can be switched to give either a 12 or 24 hour readout. It also has an automatic CW Identifier into which the owner's call sign can be programmed. As a sample of this supply was not available at the time this review was compiled we cannot comment on its operation.

The standard FP301 supply is capable of delivering 13.5 volts at a maximum current of 25 amps. The regulation from no output to 20 amps is better than $\frac{1}{2}$ volt. A total of five transistors, four in the output, one driver plus one IC to provide overload protection, and a heavy duty diode bridge make up the solid state compliment.

As Yaesu suggest this supply could be very handy around the shack to power other pieces of gear — even that old valve FM rig.

THE FT301D ON THE AIR

Setting up the 301 and getting on the air is a very simple procedure. The power input from either the AC power supply or the 12 volt DC source is via a 12 pin Jones socket on the rear of the transceiver. The antenna connector is a standard SO239. Yaesu supply a good quality push-to-talk dynamic microphone fitted with the now standard four pin screw-on connector. As soon as the power switch is closed the set comes instantly to life — both on transmit and receive. After providing a 50 ohm antenna, bands can be selected by simply setting the band switch and peaking the 'TUNE' control for maximum receiver output near the calibrated point for that particular band.

The main tuning control, which is a combination of gear and planetary drive, is extremely smooth. A finger hole is provided to fast tune from one band section to another and this is of adequate size to really spin the knob at a fast rate.

The digital readout is very clear and indicates frequency to the 100 Hz points. There are five digits on 80 and 40 metres and six digits on 20 metres and above. The actual size of the readout is 60 mm wide and 10 mm high. Tuning a transceiver with a digital readout takes getting used to. The initial tendency is to overshoot when aiming at a specific frequency and it takes quite a bit of practice to stop at a predetermined point.

Receiver performance is excellent. The fast-medium-slow AGC selection enables the correct amount of delay to be set to suit the strength of the incoming signal. For instance on 80 metres at night with a moderate static level and fairly strong signals, the slow AGC setting gives a marked increase in signal to noise ratio.

The receiver rejection filter was most effective in removing heterodynes of stations tuning up on or near the operating frequency. An interfering signal reading 20 dB over 'S'9 could be reduced to about 'S'3 and this amount of rejection remained much the same regardless of the actual beat frequency.

Receive audio through the speaker built into the matching power supply was very easy to listen to. The combination of very good AGC action, low distortion in the SSB detector and receiver audio section, and a well matched speaker all added up to much better than average results.

Transmitter tune up consists of advancing the 'DRIVE' control for a 10 amp reading on the meter, peaking the 'TUNE' control for maximum current and then further advancing the drive control for a 15 amp reading. So long as the final is properly matched this reading will indicate a full 200 watt input.

We checked the actual power output on each band with a Swan WM-1500 power meter and the FT301D connected to a Heath Centenne 50 ohm dummy load. A Heath S6E10 monitor scope was also in circuit to determine the PEP output. The following results were obtained.

| BAND | RMS OUTPUT | PEP OUTPUT |
|------|------------|------------|
| 160 | 100 watts | 100 watts |
| 80 | 110 watts | 120 watts |
| 40 | 150 watts | 150 watts |
| 20 | 75 watts | 75 watts |
| 15 | 125 watts | 120 watts |
| 15 | 100 watts | 125 watts |

No reason could be determined for the slightly lower output on 20 metres but the difference is small in practice. The output wave form on the scope was true copy book style in both the CW and SSB modes. In fact the CW carrier pattern was the cleanest of any transmitter so far tested.

It appeared that the transmitter could be run at full input in the CW mode almost indefinitely. After several minutes of such operation the heat sink of the transmitter

was only moderately hot but the power supply heat sink was very hot and could represent a hazard to unsuspecting people if in an exposed position. Under normal SSB operation it did not get quite as hot but after a lengthy period with continual use of the RF processor, the temperature built up to quite a high degree.

The action of the processor was quite satisfactory and appeared to produce about 20 dB of clipping. No panel control was provided for adjustment of the clipping level. In use on the air it produced results similar to clippers reviewed earlier this year.

On air reports of the transmitted audio quality were all most satisfactory and in all cases a great deal of interest was expressed in the unit.

VOX operation was quite smooth and an adequate degree of adjustment was provided on the delay and anti-trip controls to enable the most critical VOX enthusiast to set them to his liking. Mechanical noise from the relays was moderately high but no electrical clicks or pops were audible. The VOX was also satisfactory for CW operation however the delay required for this mode is usually much shorter and it is necessary to remove the transceiver lid and reach through a small hole with a fine screwdriver to make the change. The microphone gain control is also an internal preset. It is however provided with a plastic shaft to make adjustment easier.

The front panel controls are a mixture of good and bad so far as operation is concerned. The bad points were mostly covered in the review of the FT221 and unfortunately persist in the 301D. Although the lamp illuminating the meter has been increased in output, the scale is still hard to read. A return to the translucent type scale with rear illumination as used on the FT220 series is badly needed.

The panel knobs have no white index marker to show which way they point. Admittedly there is a small raised moulding but it is easy to miss this when the control is gripped in the normal way.

VFO stability was checked and found to easily meet the specified 100 Hz per half hour. Drift for the first half was almost exactly 100 Hz, and over the next hour and a half did not exceed 150 Hz. However, over the same period of time, the digital readout shifted 800 Hz. An interesting case where the VFO is more stable than the frequency counter.

Calibration of the dial to the marker oscillator was a little different to setting a normal type dial. The transceiver was tuned to zero beat and then the 'Calibrate' control adjusted to bring the readout to the zero point. As no offset shift is provided on the VFO with change of sideband, it is necessary to recalibrate when changing from upper to lower sideband. When the offset tuning is adjusted however the readout changes accordingly, you only have to remember what it was before.

Another unfortunate carry-over from the FT221 is the use of miniature 3.5 mm

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Connectors: UHF type 50-225. Dimensions: 5 1/4" H \times 5 1/4" W \times 6 1/2" D.

*Using a 50 ohm noninductive load

HN-31

Heathkit VHF Wattmeter/SWR Bridge

Kit HM-2102, \$51.20

HM-2102 SPECIFICATIONS - Frequency range: 50 MHz to 160 MHz. Wattmeter accuracy: $\pm 10\%$ of full-scale. Power capability: To 250 W. SWR sensitivity: Less than 30 W. Impedance: 50 ohms nominal. SWR Bridge: Continuous to 250 MHz. Detectors: UHF type 50-225. Detectors: 516-A II \times 514-A II \times 645-A II, essentialized as one unit.

*Using a 50 ohm noninductive load

Heathkit HP-23B Fixed-Station Supply

Power requirements: 120/240 VAC, 60/50 Hz, 200 watts maximum. High voltage output: 800 VDC no load, 700 VDC @ 250 mA $\pm 10\%$ AC ripple. Less than 1% drift. 250 mA. Output: 150 mA continuous to 300 mA $\pm 50\%$. Low voltage output: High tap: 350 VDC no load, 300 VDC $\pm 10\%$ AC ripple. Low tap: 275 VDC. no load 250 VDC $\pm 10\%$ Less than 95% AC ripple @ 150 mA, continuous duty to 175 mA. Fixed bias: -130 VDC $\pm 10\%$ no load: -190 VDC $\pm 20\%$ no load. Filament voltage: 12.6 VDC ± 5.5 amper. Dimensions: 9" L \times 4 1/2" W \times 8 1/4" H.

Kit HP-23B, \$98.50

New Heathkit solid-state Dip Meter

Another Heath value triumph — a better dip meter at lower cost. The Colpitts oscillator covers 1.6 to 250 MHz in fundamentals with a MOS-FET paraphase amplifier and hot-carrier diodes for more sensitivity and a better dip. It uses a Q-multiplier for greater detector sensitivity and a responsive 150 μ A meter movement for positive resonance indications. It includes a phone jack for modulation monitoring. It's smaller and lighter than others, too. Completely portable. Whether you're checking resonant frequencies, adjusting traps, looking for parasitics, or using it as a signal generator, the HD-1250 is designed to go anywhere. It fits your hand and thanks to its solid-state design and 9-volt battery operation, it's ready to use instantly wherever you are. The custom-molded gray carrying case protects the meter and the 7 color-coded, pre-adjusted, plug-in coils in transit, and makes a handy storage place. .

Kit HD-1250, \$89.00

Heathkit Code Practice Oscillator

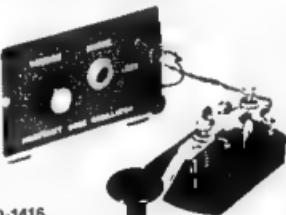
As much fun to build as it is to use — and it makes a great starter kit for a beginning CW operator. The molded plastic cabinet with dark green front panel matches Heathkit "SB" series gear.

Safe, portable and reliable, the HD-1416 is designed in the Heath tradition of top quality and value. Most components mount on a single circuit board for easy assembly. The unit operates from a single inexpensive 9-volt transistor battery (not supplied) and comes complete with telegraph key and phone jack. The oscillator, with built-in speaker, has a separate control for volume on the front panel — as well as a tone control accessible from the back of the cabinet. The HD-1416 can also be used as a side tone oscillator with any transmitter using grid block keying — such as the Heathkit DX-605.

Kit HD-1416, \$20.00



HD-1250,



HD-1416,

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HEATHKIT

sockets for the headphone and key connections. Perhaps Yaesu is trying to set the trend, but until this is established these miniature jacks are awkward to use.

INSTRUCTION MANUAL

The manual supplied with the FT301D is presented in the typical Yaesu manner. Some forty-six pages cover the following subjects. General Description, Specification, Controls and Switches, Rear Panel Connections, Preparation for Operation, Operation, Block Diagram, Circuit Description, AC Power Supply, Frequency Counter Unit, Maintenance and Alignment, and Parts List.

NEWCOMERS NOTEBOOK

*Rodney Champness, VK3UG
David Down, VK5HP*

AN AUDIO KEYING SYSTEM FOR TRANSMITTERS

This device is designed to accept audio in the form of morse code from a tape recorder to key a transmitter. You may ask of what value is such a device to the average amateur? It is perhaps of value to those amateurs who assist newcomers to amateur radio with slow morse practice and who wish to use their tape recorder to send pre-recorded slow morse. I wrote an article a few months back dealing with slow morse and this is the equipment that can be used by the slow morse transmitting stations in the course of conducting those sessions. To the newcomer this circuit appears to have no relevance. However, it is most useful to show people how the differing characteristics of silicon and germanium semi-conductors can be used to complement one another.

It is assumed by many people that diodes, whether they be semi-conductor or valves, conduct in the forward direction as soon as the voltage applied starts from zero. However, this is not true and the voltage has to build up to an appreciable fraction of a volt before the particular diode will conduct. Germanium diodes appear to have a turn on voltage between 0.15 and 0.333 volts, whilst silicon diodes have a turn on voltage between 0.5 and 0.7 volts. These characteristics are used in this audio keyer to simplify the overall circuitry.

This keyer will accept audio inputs which vary between 0.4 volts and 6 volts RMS and key reliably. The minimum power necessary to actuate the keyer is less than 10 milliwatts if the germanium diodes have a .cw switch on voltage. The audio is fed into the audio jack to R1 and the two back to back silicon diodes D1 and D2. D1 and D2 will not conduct unless the audio peak voltage rises above 0.5 volts. They will then clip both peaks of the wave and as the input level rises to higher levels will clip the audio input to $0.7 \times 2 = 1.4$ volts peak to peak. This clipped audio wave is then presented via C1 to a half wave voltage doubler using two germanium diodes D3 and D4. The turn on voltage of these two diodes is approximately 0.2 volts, so the capacitor C1 is charged up to 0.5 volts on the first half cycle. On the second half cycle this voltage 0.5 volts, plus the other clipped half cycle of 0.7 volts, is added to give a pulse of 1.2 volts. However, 0.2 volts of this is lost in the voltage

The circuit description section provides a circuit diagram of each printed circuit board and a clear description of its operation and how it ties in with the whole set. The maintenance and alignment section provides adjustment information for the multitude of preset controls. Unfortunately no printed circuit layouts are included.

Each time I complete a review of a new transceiver I wonder how and who will service it in the future when the need arrives. There is no doubt that the modern transceiver is a very reliable piece of gear. It is also highly complex and requires more

than the old multi-meter to trouble shoot

In this regard it's nice to know that competent service is available from the distributors of Yaesu gear in Australia. As of now Bail Electronic Services supplies with every piece of gear sold a check list covering some 53 different points. A copy of this is retained by the distributor and so at any future date the performance can be compared with the original.

The FT301D used in our review was supplied by B&I Electronic Services from whom details of price and delivery can be obtained. ■

diodes D1, D2 and D5 clip the input wave and resultant DC output to a relatively constant level despite variations in input level. The diodes D3 and D4 rectify the audio and produce a DC voltage which actuates the transistor and relay. If all silicon devices were to be used the circuitry would have been considerably more complex, with several more active devices being used.

The audio level meter is not strictly necessary, but can be a useful addition to make sure the level from the tape recorder is sufficient to actuate the device reliably. R4 is a peak current limiter for the audio level diode D7. C3 filters the output and the DC is applied via R5 and R6 to the 1 mA meter used to read the audio input level. R5 is set such that the meter registers 20 per cent of full scale when the keyer is keying reliably.

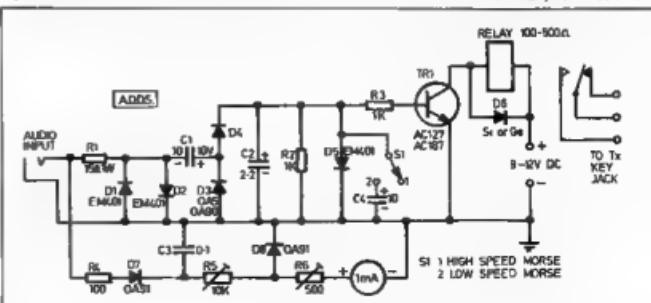
The audio level is increased such that the meter needle hits the stop with R_6 at minimum resistance. R_6 is then adjusted such that the meter easily approaches the FSD stop. If the input is increased further, the meter needle will not bang hard against the stop with high level and Morse coming into the keyer.

The audio level is set at 50 per cent of full scale def action (FSD) to make allowance for variations in tape output levels and the tape lifting off the tape heads when keying a transmitter.

The voltage drop across the meter and R6 is arranged to be slightly greater than the turn on voltage of D8, so that the meter will not suffer heavy overloading if a

drop in D_4 , so potentially 1 volt is present across C_2 . D_5 is another silicon diode wired for forward conduction and it conducts clipping this voltage to between 0.5 and 0.7 volts VDC positive with respect to earth. R_2 acts to discharge C_2 completely between Morse code characters. The voltage across C_2 is applied to TR_1 a germanium small power transistor via a base current limiting resistor R_3 . The transistor is switched on and draws current sufficient to pull in the relay which keys the transmitter. The switch on voltage of a germanium transistor is of the order of 0.15 to 0.2 volts.

The keyer is a relatively simple device which is tolerant of variations in audio input levels of between 20 and 30 dB. The



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PETER SCHULZ, VK2ZXL.

high output is put into the audio keyer. You will see many multimeters with diodes placed across their terminals. These are usually silicon diodes with a turn on voltage of 0.5 to 0.7 volts whilst the meter may well have a FSD sensitivity of 0.1 volts drop across it. The meter will suffer a 5 to 7 times FSD overload before the diodes have any effect. It is rather doubtful in some cases whether in fact the protection diodes are any real value. The meter in the audio Morse keyer, as you

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Eric Jamieson, VK5LP
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|-----|--------------------------|---------|
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| VK2 | VK2WI, Sydney | 53.460 |
| | VK2WI, Sydney | 144.810 |
| VK3 | VK3RTG, Vermont | 144.700 |
| VK4 | VK4RTL, Townsville | 53.600 |
| | VK4RTT, Mt. Mowbray | 144.400 |
| VK5 | VK5PQ, Mt. Lofty | 53.800 |
| | VK5PQ, Mt. Lofty | 144.800 |
| VK6 | VK6RTW, Perth | 53.200 |
| | VK6RTU, Kapunda | 52.250 |
| | VK6RTW, Albany | 82.860 |
| | VK6RTW, Albany | 144.500 |
| | VK6RTW, Perth | 145.800 |
| VK7 | VK7RTM, Launceston | 82.490 |
| | VK7RTX, Devonport | 144.890 |
| | VK7RTW, Lenape | 492.475 |
| VK8 | VK8VFW, Darwin | 82.290 |
| 3D | 3D3AA, Suva, Fiji | 52.590 |
| JA | JD1YAA, Japan | 88.110 |
| HL | HL2WI, South Korea* | 88.110 |
| KG6 | KG6JDX, Guam | 88.110 |
| KH6 | KH6EQI, Hawaii | 56.104 |
| ZL1 | ZL1VHF, Auckland | 145.190 |
| ZL2 | ZL2MHP, Upper Hutt | 28.170 |
| | ZL2VHP, Palmerston North | 52.590 |
| | ZL2VHF, Wellington | 145.290 |
| | ZL2VHP, Palmerston North | 145.250 |
| ZL3 | ZL3VHF, Christchurch | 491.850 |
| ZL4 | ZL4VHF, Dunedin | 145.380 |
| | ZL4VHF, Dunedin | 145.480 |

SIX METRES OPEN . . .

And how Saturday 23/10/76 . . . the day of the sun ad vice will be remembered in several ways. journeyed 250 miles to the south-east of VK5 and from my position at Southend, a little seaport up the coast from Mt Gambier was fortunate to enjoy many breaks in the cloud cover to allow 53 sun ad signs to be taken of the eclipse — these are now being processed so hopefully some will be OK. Of course things do happen on the few occasions leave my premises and this time it happened in a really big way. First news of something special came in a phone call from VK7JY who advised that on 23/10 8 m metres opened to VK5 calling the morning of 23/10 John heard a JA call sign answered him, and back came a VK4. After working him the JA was gone, but on the band more JA stations were heard.

For a period of an hour JA stations were heard abo 9 m and a total of 16 were worked. John VK7JY worked 9 JA's. Jim VK7JG (ex-720J) and Kevin VK7ZAN each 5. Signs varied from 54 to 59. Distinct amateur were JA1, JE1, 2 and 3. JH2, JH3 and JE3. They heard JH1ECU working a VK3, so they knew the VK3 boys were in on it too.

Many thanks for the news John the promptness of advice is very much appreciated. I also thank John VK7JY who phoned in advise of the incorrectness of the call sign for the six metre beacon in Northern Tasmania. I had been listing

can see, is fully protected against over-load.

I hope that you have found this little excursion into some of the rarely exploited

DIODE CHARACTERISTICS

| Type No. | Type | Volts drop at 0.3 mA | Volts drop at 30 mA |
|----------|---------|----------------------|---------------------|
| EM404 | Silicon | 0.5V | 0.7V |
| OAS | Ger. | 0.15V | 0.4V |
| GEX66 | Ger. | 0.16V | 0.65V |
| OA91 | Ger. | 0.22V | 1.00V |

features of silicon and germanium diodes of interest, each type having its own particular points. — VK3UG.

it as VK7RMT instead of VK7RTM, the correction is now in effect.

Well that phone call from VK7JY started me almost wishing I had stayed away from the eclipse, but then a day or so later in rolled a bulging envelope from Steve VK3BIZ in Melbourne, crammed full of news of the opening on that Saturday. The best I can do is to largely give you the news as it came to me as it is all so interesting, and will have a lot of mouth watering before the reading is finished. I am much indebted to you Steve for the constant information you feed me, and this one being so special will be appreciated by all the DX gang.

Steve writes "What a fantastic 6 metre day 23/10/76. Commencing 0021Z VK4 were worked from Melbourne to Brisbane and up to Ingham area. After working 10 metres VK4GI came up calling CO on 8 metres at 0356Z. I was in contact with UA6LBU for 10 minutes. I then heard VK4GI just 10 sec hello. I was still in QSO with UA6LBU and suddenly bang! A huge signal came up over the top of VK4GI signning JH6BUN that JH1ECU 5 x 9+—, I signed with the Russian station after relaying the JA's back over 10 metres showing him the strength. The following areas were worked

0400-0432 JA1 — All Prefecturees
0432-0439 JA2 — All Prefecturees.

0439-0446 JA3 — Osaka
0445-0447 JA4 — Okayama

0449 JA5 — Kagawa
0449-0452 JA6 — 2 Prefecturees

0500 JA7 — Fukukua.
Heard were JA7, but no JA8 or JA9

0530 JA8 — Okinawa Island

No HL8WI beacon, plenty of JA's on 50.150. Televison birdies all around 50 MHz peaking north.

0545-0551 CW CO from VK3BIZ QRM call to 0505-0515 CW CO from VK3BIZ QRM call to 0510-0515 CW JA0CC7 Called JA0CC7

Response in CW QSY QSY I moved to 50.010 Called JA0CC7?

Response QSY down 20. I moved to 52.000. Called QRM JA0CC7 No response.

Tuned down to 51.990 and heard VK3BIZ VK3BIZ CO from UA6CCW K.

I offset clarifier, gave 559 RST at least 10 times and QTH.

Response VK3BIZ de UA6CCY 569 UR RST name Vlad OTH . . . noise etc QSB. More tries same result noise etc.

0521 UA6CCW de VK3BIZ

Response SB SBY . . . QSB . . . noise

then VK3BIZ de RA0CCM RA0CCM K

Response RA0CCM ? ? VK3BIZ RST 539 539 K.

Response VK3BIZ de RA0CCM name Victor OTH

KH . . . VK . . . 7 . . . noise QSB

Me R R R RA0CCM de VK3BIZ RST 539 name Steve K etc etc

Response R R R VK3BIZ de RA0CCM RST 539 Steve OK OM K

Me R R R Victor OM TU FB QSO PSE QSL via BURO PSE K K

Response R R R 73 73 73 VK3BIZ . . . noise etc de RA0CCM K.

Me R R R 73 73 de Melbourne, Australia etc.

Need I say any more?

A contact with JH6GRAY was then started at 0536 from Okinawa on 50.021 but signals QSB into noise, and all TV birdies disappeared by 0600Z. I then moved to 10 metres and worked many more JA and UA stations.

Following is some Russian VHF information

UA0CCA to UA0CCO indicates a class of licence, full class up to 500 watts.

RA0CCA to RA0CCZ indicates a telephone or novice type licence to 50 watts.

Location City of Khabarovsk 800 miles NNE of Vladivostok Postal Care of Box 024, Vladivostok No. 601. Soviet Russia.

Six metres allocation or a Club basis only 50 to 52 MHz. VHF Propagation studies. Antenna 10 element yagi, with 15 element proposed JA0-9. Worked on 2 metres tropo July to September 1976, also Western Australia on 2 metres.

In future suggested procedure call on 28.000 SSB for response and nominate 52 MHz frequency. For those with transceiver, use your carrier with 10 kHz offset, transmit on 52.005 and listen at 51.996.

Stations worked during the opening VK3BZ 144.7 Z JA3, VK3AMK 11, VK3AMK 6, VK3ZBY VK3ZSJ each 5 sec etc

STOP PRESS:

ZL1VHF beacon copied on 145.100 by K6Q5.5/KH6 last week . . .

Again, many thanks Steve for that interesting run down. This will certainly help to keep six metres more alive this year, and indicates we may not have to always wait for the sunset peaks to find the long distance DX. With better equipment and probably with more people able to be around with spare time such contacts may become more common. However, once again it demonstrates the disadvantages we are facing by our 2 MHz allocation above the world wide standard of 50 to 52 MHz. With the case of the Russian stations, they cannot come up into our segment and we cannot go down into theirs, which means all such activity has to be crammed into a few kHz at the band edge.

GENERAL NEWS

Peter VK4APG writes to advise of a message received on 20 metres that Joe WA6ADX on Guam operates a beacon from 0800 to 1000Z on 52.050 with 250 watts to a 4 element yagi pointed at Australia. This beacon is CW using "QO" call sign GUAM then listening period before keying again. Joe monitors frequency during breaks many thanks Peter

I have also received a letter from Mike call sign not mentioned, who is now living at Ceduna in ex-VK5SSU territory. Mike advises being able to operate on 8 metres SSB with an FTV655 and FT200 to a 5 element yagi at 50 feet and on 2 metres SSB with an IC202 with 3 walls at present but eventually 300 watts, to a 9 element yagi at 60 feet. He is building a 4CX250B I hear but with the usual problem of some parts. Plans are to eventually monitor the Adele and Chagos. 8 repeater Mike will be somewhat limited in time to operate and indicates therefore the Ross Hul Contest will not be in jeopardy from there for the time being.

Anyway, it's good to hear that activity will continue on VHF from Ceduna, and both the VK5 and VK6 boys will be interested to do some listening, particularly when you have 300 watts or 144 M-2 SSB.

MOONDOON REPORT

From Lyle VK2AL and "The Propagator" comes the monthly EME report which mentions that the scheduled moonbounce tests were carried out on the morning of 28/6 with W3LO, who was not heard, and W3LLA, who transmitted he was hearing VK3AMW at "FM" copy. We heard his signal weak for most of the test period and they came up to 3 dB above noise on his last transmission.

This allowed copy of full call signs but the test period ran out before a contact could be made.

Letters were received from K3PGP and W4ZKI before the test weekend, requesting tests with each of them during the hour immediately prior to the scheduled tests. However, moonrise was such that our low-band first transmit time was only 15 minutes before the start of the scheduled tests. Both stations were called but no replies heard. Our echoes peaked at 9 dB above noise during this test period. Our noise was checked at 13 dB above sky noise.

A further series of scheduled tests were carried out during the evening of 26/9 with European stations. Q2BCP was called but not heard. SK6AB was heard calling us and he was acknowledged, but another European station came on frequency during the last part of the test period and blotted him out.

The last set of 1/2 hour of the test periods was scheduled as a CO report for VK2ANW. We were called by LX1DX in Luxembourg, who gave us 'O' reports (good signal strength). He signals peaked at 7 dB above noise and we were able to copy full calls without difficulty. Reports were acknowledged both ways for the first Australia-Luxembourg 70m contact.

'holes' signal emanation from the stars at the Geostation centre was checked at better than 2.5 dB above cold sky no noise. This information is now being evaluated to provide antenna gain - receiving system noise figure ratio crash which can be correlated with our noise measurements and cold

— 50 ohm input termination resistor noise action (3.5 dB)

VK2ZEN and VK2ALU carried out the September tests*.

Also on the moonbounce scene this time we have some news from Chris VK5MC and his 144

MHz EMC efforts thanks to the pages of "The Blurb". Chris writes:

"Over the past couple of months my windows for moonbounce have been troubled by the sun being in the same part of the sky as the moon. But they have now started to separate once more and signals are being heard."

21/7/76 1700Z After repairing an isolating relay the night before, I found that no echoes were being received at the centre time. Quickly climbing the feed tower, and using a match to wedge closed the suspect relay so that I could receive, I tuned the band and immediately heard KB3II. I took the chance of blowing up the pre-amp and isolated him with a dipole with 100' of RG58 and 340' RST. I later received QSL card from him with a note from which I quote 'My array of 32 yagis has been down due to ice since March, all I have now is 8 x 14 element KLM's ...' Men, what determination! Most people are lucky to see 32 element's in the air alone 24/7/76. . . . heard WAB7BII and W2AZL having a contact — also heard KB3II calling me, but no contacts resulted 25/7/76. . . . worked a new one K9HMB Report sent 439, received 'O' report.

"A final note of interest. Have heard 3 dB of excess noise from the Milky Way, and this morning measured 17 dB of sun noise. More later."

Thanks Chris for the report, would like to hear of some of your later exploits.

END

From time to time I receive requests from some writers for news of ATV activity. I will be glad to pass on such information through this column if it is sent to me, but it must be years since anyone has written to say what they are doing. Sorry you guys who are fretting for information, I cannot help you at the moment, but perhaps this plea will bring something of regular results.

Well, the summer DX season is with us now, and by the time you read these notes perhaps some exotic contacts have been made. While 6 metres seems to have a lot of glamour at the time, don't overlook the 2 metre band lots of things can happen there. Peak time for long distance DX there seems to be towards Christmas so be on the lookout for the special C type of DX. In the Southern hemisphere have a dipole antenna in the dousing and invert on type contacts, particularly along the southern coastlines. I have been possible to work from VK3 and VK5 into Albany around January and February for several years now and 1977 may be the same.

As the Christmas season approaches may I take the space to wish everyone a very happy Christmas and a Prosperous New Year. I would like to thank everyone who has written to me during the past year giving me news and information for the column — it's pretty hard to keep it going sometimes, but I do the best I can. My thanks also to those various Clubs, and there are many, who consistently forward me copies of their newsletters and publications, use them from them whenever I can which is of overall interest. Special thanks to Mac ZL3RK who keeps my subscription going to "Break In" in return for which I make sure he gets AR. Last but not least my thanks and best wishes to the Editor for his co-operation and tolerance of me, and the lack of complaints which seem to be the situation.

With all those special thoughts for the time of the year I would like to close with a special thought for the month of May all your troubles during the coming year will be as far removed as your New Year "Resolutions". And Women, say a big ding-dong brooch to jewel every salesman I'm looking for a Christmas gift for a husband who got me an outboard motor last year".

72 The Voice in the H is

IARU NEWS

Mr. Owen reported on return from his overseas journeys that the presentation shield he handed over to JARL on behalf of the WIA was very well received. Greetings to JARL on their 50th anniversary, from many amateur societies, were included in a well-produced booklet specially produced for the occasion.

WARC '78

The Federal President attended the 3rd meeting of the IARU on 5th October and reported that discussions concerned mainly on administrative matters. The next meeting scheduled for 1977 should start with preliminary fifty-nifty details affecting the frequency spectrum in Australia.

During October the WIA voted in favour of the admission of the Radio Amateur Society of Thailand to the IARU, Region 3 Association.

A letter was received from the Secretary/Treasurer of the PNG Amateur Radio Society advising that a Constitution for this Society has been agreed and recruiting for members was being undertaken. The writer was Gavyn Wylie P29JW and he advised that John Baker P29WB was the President. This will be a most useful addition to amateur radio in Region 3 and deserves full support. The Society's address is P.O. Box 204, Port Moresby.

K1ZND, the Assistant General Manager of the ARRL.

Two and a half days were devoted to the preparation of a model position paper to assist the smaller societies in appraising their governments of the legitimate requirements of the Amateur for frequencies through to 2000.

The International Working Group is making two significant recommendations to the Regional organisations. The first recommendation relates to the 40 metre band and the global position of the Amateur Service to seek expansion of that band. In Region 3 the band 7-160 is presently allocated to the Amateur Service. At the conference in Hong Kong the Region 3 Association adopted a policy of seeking expansion of that band "upwards". Recognising the claims by the broadcasting service to frequencies on the high frequency side of the existing 40 metre band, the International Working Group has recommended a policy to seek expansion of the existing 40 metre band both above and below the existing allocation.

The other important recommendation made by the International Working Group related to a preference for the frequency band 155-160 GHz instead of the previous recommendation of 165-170 GHz for the Amateur Service and Amateur Satellite Service. This change results from a recognition of the fact that the latter frequency band suffers from high absorption by water vapour and would be useless for terrestrial communication purposes.

The Secretary of the Region 1 Division, Roy Stevens, undertook final editing of these papers which will be printed and circulated to the regional organisations. The Directors of the Region 3 Association will shortly be considering the adoption of these documents and then will attend to circulation of copies to the member societies of Region 3.

The members of the International Working Group also attended a reception held at the ITU and met delegations attending the Frequency Management Spectrum Seminar being conducted under the auspices of the International Frequency Registration Board, members of the International Amateur Radio Club and officials of the International Telecommunications Union. In addition, a meeting was held with the President of Desousa Des Amateurs Français (REF), Masseur M. J. Cousal, PBF and other officers of REF.

Michael S. Owen VK3KI.

20 YEARS AGO

Ron Fisher, VK3OM

DECEMBER 1956

What were the aims of the Institute twenty years ago? The Editorial page of December 1956 Amateur Radio stated these aims which might be worth repeating.

To act as the voice of the Amateur in public discussions.

To assist in the investigation of communication problems.

To conduct educational work.

To provide a medium for exchange of ideas and to publish a journal.

To promote friendship between amateurs.

The Editors then went on to suggest that we all should endeavour to encourage some young enthusiasts. This was important twenty years ago. It is even more important today. With so many young people turning to the HF amateur operation on the 20 MHz band, we must make every effort to encourage them in the right direction.

Another Two-Metre Converter Bob Winch VK2OAA described his new design that produced a fantastic 5 dB noise figure when first turned on the RF end and used a BAK5 G3BT cascade to a BAK5 mixer.

Clamp tube modulation was popular in the 1950s. Most people who used the famous type 5 mark 2 transceiver probably tried the system of modulation at one time or another. F. W. VYKOR described two different ways of doing it. The 1956 Remembrance Day results gave a wide win to WYKOR. Top scores in each State were YVQATN, VK3ATN, VK4EH, VK5EH, VK6ED, VK7AD and VK8D.

Federal notes column advise that the VK1 prefix has been allocated to the Federal Capital Territory and that Antarctica, previously VK1 would become VK2.

IARU INTERNATIONAL WORKING GROUP MEETS IN GENEVA

The "International Working Group" convened by the President of the International Amateur Radio Union, Noel Eaton VE3CJ met in Geneva from the 17th to the 20th September, 1976.

Members of this Working Group included Roy Stevens, G2BVN the Secretary of the IARU Region 1 Division, Michael Owen, VK5KI, a Director of the IARU Region 3 Association and Vic Clark, P4WFG, the President of the International Amateur Radio Union on Region 2 Division. Also present were Jim Hughes, G3GVV and David Summer,

How many New Members have YOU introduced this MONTH?



Newnes Technical Books *for the Ham*

RADIO VALVE AND SEMICONDUCTOR DATA

10th Edition, by A. M. Ball

178 pages 257 mm x 210 mm 1975

'... Inspection of the book suggests that the data is a good deal more comprehensive and carefully set out than in many other publications we have seen.'

ELECTRONICS AUSTRALIA

NEWNES RADIO ENGINEER'S POCKET BOOK

14th Edition, edited by P. Lafferty

192 pages 76 mm x 124 mm 1974

An invaluable compendium of radio facts, figures and formulae, indispensable to the designer, student, service engineer, and all concerned in the radio industry. New tables include radio and television frequencies and channels and information on metric wire sizes.

GUIDE TO BROADCASTING STATIONS

17th Edition, material supplied by BBC Tatsfield Receiving Station.

176 pages 190 mm x 127 mm illustrated 1973

This seventeenth edition of a title which has sold more than 250,000 copies contains useful fundamental information on radio receivers, aerials and earths, propagation, signal identification and reception reports in the chapters at the front.

FOUNDATION OF WIRELESS AND ELECTRONICS

9th Edition, by M. G. Scroggie

552 pages 215 mm x 135 mm 1975

'... The 9th edition is much larger than the earlier versions and it indeed needs to be to cover, as it does, the whole gamut from fundamentals, to modern technology.'

'... In fact, the contents list is 9 pages long and is itself, a most useful feature of a very comprehensive and useful textbook. Highly recommended.'

ELECTRONICS AUSTRALIA

ASK FOR THEM AT YOUR LOCAL
BOOK OR COMPONENT SHOP

1976 REMEMBRANCE DAY CONTEST RESULTS

| | a | b | c | d | e | f |
|-----------|-----|------|------|------|-------|-------|
| VK5 & VK6 | 227 | 845 | 26.8 | 1576 | 65590 | 19137 |
| VK4 | 210 | 819 | 25.6 | 1229 | 67798 | 16648 |
| VK6 | 77 | 522 | 14.8 | 982 | 22563 | 4306 |
| VK7 & VKD | 41 | 243 | 18.9 | 1093 | 13431 | 3359 |
| VK2 | 111 | 2226 | 5 | 1363 | 30054 | 2862 |
| VK3 | 97 | 2135 | 4.5 | 1092 | 31467 | 2522 |
| VK1 | 22 | 131 | 16.8 | 800 | 7866 | 2121 |

a=Logs received
b=Logs received
c=Logs received
d=Average top 6 logs
e=Total score
f=Trophy score
c-% participation

DIVISIONAL SECTION LEADERS SCORES ARE SUBJECT TO FURTHER CHECKS

In the following detailed scores the first figures are the points scores and the second are contacts made.

VK1

Phone

| | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|----|----|
| ACA | 721 | 551 | MF | 297 | 149 | YR | 79 | 79 |
| VP | 705 | 502 | LP | 250 | 119 | ZMV | 66 | 66 |
| CV | 624 | 325 | BH | 163 | 51 | ZPB | 45 | 45 |
| BR | 592 | 255 | GB | 177 | 82 | WI | 12 | 12 |
| DF | 344 | 172 | ZAR | 152 | 132 | RY | 8 | 5 |
| ZT | 324 | 193 | ZUJ | 123 | 123 | PM | 7 | 7 |

CW

VK1

Open

| | | | | | | | | |
|----|------|-----|-----|------|-----|----|-----|-----|
| DC | 1073 | 462 | AOP | 1050 | 457 | DA | 826 | 302 |
|----|------|-----|-----|------|-----|----|-----|-----|

VK2

Phone

| | | | | | | | | |
|------|------|-----|-----|-----|-----|-------|----|----|
| BVC | 1541 | 886 | BCW | 183 | 54 | ZBG | 51 | 51 |
| XT | 1147 | 407 | CH | 177 | 77 | AWX/2 | 50 | 50 |
| BOT | 915 | 339 | WT | 162 | 87 | CD | 48 | 48 |
| AGF | 911 | 310 | BZ | 158 | 54 | AIB | 44 | 29 |
| NW | 790 | 321 | CM | 150 | 67 | ZIK | 44 | 44 |
| RW | 755 | 300 | AXU | 143 | 58 | ZVN | 40 | 40 |
| BDDN | 696 | 298 | BRU | 137 | 50 | CF | 38 | 17 |
| AHV | 603 | 255 | CAF | 130 | 60 | LE | 34 | 20 |
| AJY | 583 | 266 | NP | 127 | 51 | BAD | 36 | 36 |
| AKY | 520 | 181 | BGG | 121 | 50 | SP | 29 | 29 |
| ADZ | 517 | 191 | AVL | 124 | 56 | ZUR | 29 | 29 |
| ALZ | 547 | 130 | PT | 122 | 37 | BR | 28 | 19 |
| DR | 343 | 168 | ASG | 122 | 37 | BR | 28 | 19 |
| AJH | 334 | 107 | HI | 108 | 35 | WD | 28 | 14 |
| AJY | 324 | 141 | PN | 105 | 32 | NV | 24 | 24 |
| ZD | 321 | 133 | ABH | 105 | 31 | VEC | 23 | 23 |
| BMX | 303 | 120 | BTK | 102 | 34 | ZAX | 21 | 21 |
| PF | 302 | 124 | AUN | 101 | 42 | JF | 18 | 14 |
| SZJ | 284 | 114 | HO | 100 | 160 | AJQ/M | 18 | 18 |
| CW | 285 | 82 | MR | 100 | 46 | ZKG | 16 | 16 |
| BAX | 245 | 124 | UJ | 98 | 41 | AKH | 14 | 10 |
| AQ | 227 | 85 | ADL | 97 | 30 | ZID | 14 | 14 |
| FJ | 223 | 105 | RX | 84 | 54 | ZTM | 14 | 14 |
| ZB | 219 | 105 | BIN | 81 | 31 | VEG | 12 | 12 |
| DA | 210 | 105 | ZCT | 81 | 61 | EDC | 10 | 10 |
| AIM | 209 | 55 | HZ | 66 | 18 | AND | 7 | 7 |
| FM | 203 | 75 | EY | 64 | 25 | BOC | 7 | 7 |
| ABC | 193 | 58 | CS | 81 | 22 | SW | 6 | 6 |
| BFG | 187 | 85 | SJK | 57 | 34 | | | |

CW

Open

| | | | | | | | | |
|-----|------|-----|-----|-----|-----|-----|-----|----|
| DL | 1342 | 223 | XQ | 614 | 116 | ADR | 268 | 48 |
| DT | 1134 | 204 | GT | 492 | 81 | IV | 184 | 35 |
| ABY | 848 | 149 | TY | 314 | 70 | JM | 158 | 35 |
| GR | 798 | 155 | VMM | 314 | 56 | GW | 72 | 14 |
| BHO | 652 | 177 | NAG | 242 | 61 | RJ | 38 | 11 |

CW

Open

| | | | | | | | | |
|-----|------|-----|-----|-----|-----|-----|-----|----|
| CAX | 1642 | 580 | BYY | 227 | 156 | AAC | 169 | 56 |
| BO | 1370 | 417 | BLK | 197 | 103 | BCU | 71 | 32 |
| AOA | 800 | 288 | BCC | 179 | 49 | | | |
| HQ | 509 | 145 | GS | 169 | 71 | | | |

CONTESTS

Kevin Phillips, VK3AUQ
Box 57, East Melbourne, 3002

| | | | | | | | | |
|-----|----|----|-------|----|----|-----|----|----|
| QW | 65 | 30 | XV | 36 | 20 | ZJP | 19 | 19 |
| ZDS | 65 | 65 | ZMH | 36 | 35 | ZET | 17 | 17 |
| LB | 64 | 42 | ZPA/4 | 34 | 35 | BLB | 17 | 17 |
| DH | 61 | 51 | ZDA | 34 | 34 | GD | 17 | 17 |
| TO | 61 | 51 | ZDA | 34 | 34 | HD | 17 | 17 |
| ZM | 60 | 61 | ZB | 33 | 33 | IV | 17 | 17 |
| ZIT | 60 | 61 | ZB | 33 | 33 | ZV | 17 | 17 |
| ZGB | 58 | 58 | LN | 31 | 31 | ZIS | 17 | 17 |
| ZZ | 58 | 17 | NF | 31 | 9 | PY | 15 | 7 |

| | | | | | | | | |
|-----|------|-----|-----|-----|-----|-------|----|----|
| PV | 54 | 35 | ZDG | 31 | 31 | ZGJ | 14 | 14 |
| NBS | 51 | 36 | IF | 30 | 30 | ZLD | 14 | 14 |
| ZZE | 51 | 51 | ZFA | 30 | 30 | ZNZ | 14 | 14 |
| AQ | 49 | 23 | AAB | 28 | 15 | ZRG | 12 | 12 |
| FD | 49 | 49 | ZEA | 28 | 28 | GT | 9 | 9 |
| ZLL | 48 | 48 | BC | 27 | 27 | T/N/M | 7 | 7 |
| EO | 44 | 30 | TL | 24 | 15 | XG | 7 | 7 |
| HT | 1103 | 828 | BFN | 338 | 181 | YAF | 73 | 74 |
| AYF | 1032 | 588 | EF | 328 | 145 | AL | 68 | 21 |
| AWW | 885 | 424 | XF | 328 | 156 | AJP | 67 | 23 |
| BIZ | 795 | 388 | ZWM | 308 | 308 | ZDJ | 67 | 67 |
| AMK | 795 | 388 | GA | 306 | 107 | BER | 67 | 34 |
| AOZ | 785 | 413 | LY | 292 | 126 | MM | 67 | 27 |
| YO | 709 | 334 | RU | 223 | 85 | JU | 41 | 42 |
| CX | 705 | 413 | ZD | 211 | 90 | OR | 40 | 21 |
| SM | 698 | 333 | QH | 217 | 97 | ZV | 37 | 17 |
| DF | 682 | 473 | AFU | 191 | 92 | OD | 52 | 43 |
| GX | 687 | 404 | PW | 169 | 61 | RF | 48 | 24 |
| ANM | 621 | 467 | WJ | 157 | 60 | OB | 41 | 20 |
| AKK | 548 | 211 | WM | 177 | 78 | KT | 40 | 42 |
| LP | 501 | 229 | AIE | 143 | 65 | WY | 35 | 30 |
| ZI | 501 | 318 | YIE | 134 | 136 | API | 34 | 31 |
| YQ | 478 | 179 | YH | 131 | 47 | ZVZ | 36 | 30 |
| AIZ | 430 | 198 | BFA | 113 | 62 | ARA | 28 | 15 |
| BBH | 416 | 207 | AHG | 105 | 51 | ALD | 23 | 7 |
| BBU | 394 | 222 | AVY | 101 | 83 | OL | 21 | 15 |
| DB | 344 | 177 | AAJ | 97 | 46 | BCZ | 11 | 8 |
| BJH | 330 | 175 | ARS | 95 | 58 | ZLN | 11 | 11 |
| ZD | 344 | 165 | VQ | 76 | 50 | | | |

| | | | | | | | | | | | |
|----|------|-----|------|------|-----|-----|-----|-----|------|-----|----|
| CW | 2095 | 105 | HE | 2095 | 518 | WIT | 502 | 205 | ARC | 154 | 50 |
| OP | 952 | 233 | XU/3 | 454 | 111 | IQ | 100 | 28 | SE | 272 | 50 |
| CM | 734 | 187 | XB | 358 | 91 | KB | 36 | 10 | UC | 244 | 55 |
| FC | 628 | 156 | JL | 312 | 62 | ZRT | 271 | 271 | KD | 144 | 55 |
| DG | 575 | 145 | UV | 150 | 37 | ACV | 34 | 8 | LP | 280 | 50 |
| TK | 484 | 108 | ZBG | 126 | 33 | WY | 277 | 145 | SP/5 | 153 | 50 |

| | | | | | | | | | | | |
|-----|------|-----|-----|-----|-----|-----|-----|-----|-------|-----|----|
| CW | 1688 | 913 | QI | 358 | 138 | AMD | 258 | 84 | Phone | 185 | 81 |
| UM | 1688 | 913 | SD | 117 | 31 | DV | 216 | 81 | Phone | 185 | 81 |
| ALZ | 734 | 268 | AYL | 295 | 158 | VF | 253 | 105 | Phone | 185 | 81 |
| WW | 649 | 332 | PR | 292 | 111 | YF | 264 | 100 | Phone | 185 | 81 |
| YF | 483 | 149 | AUQ | 254 | 100 | | | | Phone | 185 | 81 |

| | | | | | | | | | | | |
|----|----------|-----|-----|-----|-----|-----|-----|-----|----|-----|----|
| CW | 1784 | 981 | ZRF | 326 | 333 | SD | 117 | 31 | QY | 214 | 55 |
| ZB | 1893 | 663 | FN | 225 | 154 | ZNJ | 111 | 111 | QZ | 225 | 55 |
| YB | 1893 | 663 | FN | 225 | 154 | ZNJ | 111 | 111 | QZ | 225 | 55 |
| VX | 1519 | 828 | FX | 321 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| LB | 1519 | 828 | FX | 321 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZC | 1211 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZL | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZI | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZJ | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZK | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZM | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZN | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZQ | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZR | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZT | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZU | 1130 | 102 | ZC | 121 | 102 | MA | 109 | 109 | QZ | 225 | 55 |
| ZV | 1130</td | | | | | | | | | | |

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TRANSVERTOR**

* DUE TO UNPRECEDENTED DEMAND SOME DELAYS HAVE BEEN
EXPERIENCED IN THE SUPPLY OF TS820 HF TRANSCEIVERS

Things look set for a good season, and with the large amount of off the shelf type equipment around now, activity should be fairly high. So join the contest, have a good time, meet all your old friends, make some new ones, and please submit your log. (It's much easier this year!)

John Moy's National Field Day

This contest also counts towards the 1977 trophy. Rules will be in next month's AR. It will take place on the second weekend in February. You will have from now on, time to check all the antennae, rigs, tents, pull-outs, easy's, operators and etc. Make sure you have a site to go to, and be prepared to have a most enjoyable time.

See you all in the Rose Bowl.

COMMONWEALTH CONTEST 1976

The following is extracted from the RSGB results of the 1976 contest.—

| | | |
|---|--------|-------------|
| 1 | VE7CC | 4188 points |
| 2 | VR1AA | 3755 points |
| 3 | VK3MR | 3377 points |
| 4 | VE5BMV | 3345 points |
| 5 | VE7UJ | 3322 points |
| 6 | ZL2BCO | 3227 points |

Receiving Section

1. Eric Trebilcock BCRS195 2145 points

Australian Scores

| | | | | | |
|----|--------|------|----|--------|-----|
| 3 | VK5MR | 5877 | 60 | VK3RJ | 790 |
| 2 | VK2BPN | 3038 | 62 | VK2XQ | 743 |
| 1 | VK5NO | 2937 | 63 | VK4UJA | 738 |
| 4 | VK4XA | 2535 | 65 | VK3XU | 705 |
| 5 | VK7KZ | 2132 | 66 | VK4MY | 635 |
| 28 | VK3ZC | 1848 | 69 | VK8ZJ | 635 |
| 21 | VK3XB | 1701 | 72 | VK2NS | 619 |
| 35 | VK7CH | 1428 | 77 | VK2HC | 588 |
| 38 | VK5DL | 1319 | 81 | VK2YB | 536 |
| 40 | VK5KD | 1298 | 82 | VK2HW | 533 |
| 41 | VK7THE | 1248 | 86 | VK7RY | 477 |
| 42 | VK3CM | 1181 | 88 | VK5PM | 356 |
| 43 | VK7JB | 1174 | 91 | VK3CG | 311 |
| 44 | VK7OB | 1154 | 95 | VK5FG | 209 |
| 50 | VK3KS | 1029 | 96 | VK2OT | 176 |
| 68 | VK3YK | 929 | 98 | VK5HO | 166 |
| 59 | VK5KL | 810 | 99 | VK4LJ | 140 |

Other Pacific area entrants

| | | | | | |
|----|--------|------|----|-------|------|
| 6 | ZL2BCO | 3227 | 19 | ZL2BR | 2142 |
| 11 | ZL3GO | 2725 | 28 | ZL1MV | 1800 |

and PSEU 490 in 85th position

"Snow" Campbell VK3MR therefore wins the silver medallion for the second year running, while the bronze medallion for the middle placing goes to Clarrie Castle VK5KL.

Scoring details, QSOs/Bonus per band, 80 to 10 metres are shown for VE7CC and VK3MR. VE7CC 48/33 61/35 116/32 36/27 0/0 VK3MR 38/31 88/34 108/42 9/8 0/0

RG8X Commandos

The name may have changed, but the contest remains the same. This would appear to sum up the overwhelming sentiment among entrants this year. Although there was no repetition of the excellent conditions of 1975, we were glad to receive a healthy number of logs for this year's contest. A composite lumberjack in results put the majority of top placings in the Pacific area contrasting with last year when the honours went to Europe and North America.

Once again we were delighted to welcome the large number of entries from Australia but were rather disappointed to note the continued reduction in support for the listeners section. Can it be that this is a symptom of a decline in CW interest?

Top placing this year goes to Lee Sankins, VE7CC with D. Lockyer VR1AA in second place. The latter result is somewhat amazing as Deeney notes in his log that he did not hear or work a single G throughout the entire contest. He must also be one of the few high placings in recent years not to have used a beam.

The small entry in the receiving section is no way detracts from the win by Eric Trebilcock, BCRS195, of the Racing Rose Bowl in his 35th year of participation.

The main point of comment in logs regarding the rules related to the duration of the contest was the strong feeling that we should revert to 48 hours in next year's period. This possibility was discussed by the committee last year and again this year and after much discussion it has been decided to leave things as they are for the 1977

contest. We feel that a 48-hour duration puts a great strain on VK/ZL entrants where the contest would extend well into Monday morning. Additionally, it is felt that this contest is one of the most demanding in the contests calendar, not only in terms of equipment but also in terms of propagation knowledge required and, most important of all, in the experience of the operator. These considerations are possibly what give this contest its unique appeal.

The other area of comment concerned CQ calls. The first few hours revealed the die-hards persisting with BERT and the more forward-looking with CC. We have it on good authority that the gentleman man to CC RU is not connected with any rugby organisation! However, within a short period everyone seemed to have standardised on CC BERT and no doubt this will be the pattern for the future.

1977 contest is 12/13 March, same rules as before.

QSP

1977 SUBSCRIPTIONS

Members will be receiving subscription renewal notices for 1977 at about the same time as this issue of AR arrives. Early payment greatly facilitates EDP data processing and will ensure that call book information will be correct. It is particularly important because of the serialisation of members and non-members (including unlicensed) in the 1977 call book. This work will begin during February/March when unlicensed members become liable to have their AR address labels suppressed as an automatic EDP function.

AWARDS COLUMN

Brian Austin, VK5CA

EU DIPLOMA (GERMANY)

General

1. The award is available to licensed amateurs and shortwave listeners (on a "heard" basis).
2. The award is based on the calendar year. Only contacts in the current year and 4 preceding years are valid — see note below.
3. QSL cards must be submitted with the claim, which must be made in the special booklet, available from the sponsor's Awards Manager — see below — for 3 ICR.
4. There are no mode restrictions.
5. The fee for the award is 8 IRC which covers the return of QSL cards by registered mail.
6. The address for application is:

Walter Geyharter DL3RK,
Post Box 262,
D-805 Kaufbeuren,
Fed. Rep. of Germany.

Note This is published in 1976 so the current year is 1976 and the 4 preceding years are 1972, 1973, 1974 and 1975.

One contact per country per band is valid in any one year.

One point is scored for each valid contact in the current year (1976) and the preceding year (1975).

0.5 of a point is scored for each valid contact in the next preceding year (1974).

0.5 of a point is scored for each valid contact in the next preceding year (1973).

0.25 of a point is scored for each valid contact in the next preceding year (1972).

Totals are rounded to the nearest whole point.

New applications must be submitted to arrive BEFORE the end of June and BEFORE the end of December to be counted for the current year.

Additional to scores already submitted only require the additional QSL cards to be sent to the Awards Manager.

Requirements: A total of 100 valid points are required.

Country List C31 CT1 CT2 DL/DM EA EA6 EI F G G G (Guernsey) GA (Jersey) GD GI GM (Shetland) GW HA HB9 HB9/HW HI IS IT JW (Blear) JW JK LA LX LZ MI OF OH OM9 OJ6 OK

ON OY OZ PA SM SP SV SV (Crete) SV (Rhodes) SA1 TF MA1, 3, 4, 6 U2A UBS UC2 UO0 UN1 UP2 UO2 U2 2A (Franz Josef Land) YO Y ZA ZB2 SA4 4U1 9H1

WORKED ALL ITALIAN PROVINCES

General:

1. The award is available to licensed amateurs.
2. Contacts on and after 1/1/1949 are valid.
3. Members of an IARU Affiliated Society do not send QSL cards. A list showing full details of the contacts should be certified by the Awards Manager of an IARU Affiliated Society. Non-members must send QSL cards to the sponsor.
4. There are no band or mode endorsements.
5. The fee for the award is \$1 or 10 IRC.
6. The address for application is:

ARI Servizio Diplomi,
Via Scariffi 31,
20124 Milan,
Italy.

Requirements:

Confirmed contacts with 80 different Provinces.

List of Provinces:

| | |
|---------------|------------------|
| Agrigento | Messina |
| Alessandria | Milano |
| Ancona | Modena |
| Ancona | Napoli |
| Ancona | Nовара |
| Ascoli Piceno | Padova |
| Atti | Palermo |
| Avellino | Parma |
| Bari | Pavia |
| Bari | Perugia |
| Bari | Pesaro |
| Bari | Pescara |
| Bari | Piacenza |
| Bari | Pisa |
| Bari | Pistoia |
| Bari | Pordenone |
| Bari | Potenza |
| Bari | Ragusa |
| Bari | Ravenna |
| Bari | Reggio Calabria |
| Bari | Roma e Città del |
| Bari | Roma |
| Bari | Rovigo |
| Bari | Sarzana |
| Bari | Sassari |
| Bari | Savona |
| Bari | Siena |
| Bari | Siracusa |
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| Bari | Terni |
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| Bari | Verona |
| Bari | Vercelli |
| Bari | Venezia |
| Bari | Viterbo |
| Bari | Viterbo |

LARA

Ladies Amateur Radio Association

This month, the LARA column comes from Anne VK7LY. Anne is one of the earliest members of VK3 from outside VK3 and is a familiar and welcome face at conventions here in VK3.

"While a YL operator is disadvantaged to a certain extent by lack of strength and lack of height, when it comes to the rough work the hobby for the female carries with it certain advantages.

First of course comes the fattening looks and sighs of admiration from other YLs, accompanied by the remark "Oh but of course I could never do that — I'm not strong enough". From the on, of course, the remarks are flattening rather than fattening (just to keep them in their place).

The most obvious asset is ones never-ending tool kit and spare parts supply to be found not in

AMATEUR RADIO

ELECTRONIC ENTHUSIASTS EMPORIUM

ITEMS OF INTEREST TO HOMEBREWERS. See current issue "Electronics Today International" for more detailed listing of components.

TRANSISTORS

| | | | |
|------------|-------|----------------|--------|
| BC107 | .18 | CA3018 | 3.50 |
| BC108 | .18 | CA3028A | 1.80 |
| BC109 | .19 | CA5069/MLM3080 | 2.90 |
| BS150 | .75 | CA3130/T | 1.85 |
| MPF102 | .55 | CA3140/T | 1.65 |
| MPF103 | .85 | LM3079 | 2.95 |
| MPF104 | 1.10 | LM3073 | 4.70 |
| MPF105 | .65 | LM5355 | .95 |
| MPF106 | 6.0 | LM5556 | 2.75 |
| MPF131/121 | 1.30 | LM5626 | 9.50 |
| 2N706A | .95 | LM565 | 2.80 |
| 2N918 | 1.60 | LM567 | 3.50 |
| 2N2222A | .95 | LM723 | .98 |
| 2N2905 | .95 | LM741 | .48 |
| 2N3638A | .50 | LM1496 | 1.80 |
| 2N3642 | .45 | LM3000 | 1.75 |
| 2N3819 | 1.25 | MC1350 | 1.50 |
| 2N5245 | .65 | MC1351 | 1.95 |
| 2N5580 | 7.75 | MC1468 | 6.50 |
| 2N5581 | 9.40 | MC1648P | P.O.A. |
| 2N6084 | 17.50 | MC7805 | 2.50 |
| 40637A | 2.85 | MC7812 | 2.50 |
| 40673 | 1.85 | MC7815 | 2.50 |
| 40861 | 1.50 | SO2004K | 1.95 |
| 40863 | 7.00 | TA8200 | 2.90 |
| | | TA8201 | 3.95 |
| | | TA8229 | 3.80 |
| | | ZN414 | 3.85 |

LINEARS

| | |
|----------------|--------|
| CA3018 | 3.50 |
| CA3028A | 1.80 |
| CA5069/MLM3080 | 2.90 |
| CA3130/T | 1.85 |
| CA3140/T | 1.65 |
| LM3079 | 2.95 |
| LM3073 | 4.70 |
| LM5355 | .95 |
| LM5556 | 2.75 |
| LM5626 | 9.50 |
| LM565 | 2.80 |
| LM567 | 3.50 |
| LM723 | .98 |
| LM741 | .48 |
| LM1496 | 1.80 |
| LM3000 | 1.75 |
| MC1350 | 1.50 |
| MC1351 | 1.95 |
| MC1468 | 6.50 |
| MC1648P | P.O.A. |
| MC7805 | 2.50 |
| MC7812 | 2.50 |
| MC7815 | 2.50 |
| SO2004K | 1.95 |
| TA8200 | 2.90 |
| TA8201 | 3.95 |
| TA8229 | 3.80 |
| ZN414 | 3.85 |

DIODES

| | |
|--------------|--------|
| ZENERS 400MW | 35 |
| ZENERS 1.3W | .72 |
| BA102 | .60 |
| BB105G | .85 |
| EM402 | .20 |
| EM404 | .20 |
| EM405 | .35 |
| IN916 | .10 |
| IN916 | P.O.A. |
| IN916 | 1.10 |
| IN916 | .45 |
| DA47 | .45 |
| DA80 | .25 |
| PA81 | .25 |
| PA40 | 4.80 |
| 2S30 | .95 |
| 2S30R | .95 |

MISCELLANEOUS

74 SERIES TTL

| | |
|--------|--------|
| 74800 | 1.15 |
| 74874 | 1.60 |
| 748112 | 2.50 |
| 748196 | 6.95 |
| 7400 | .36 |
| 7404 | .39 |
| 7474 | .69 |
| 7489 | 3.90 |
| 7490 | .65 |
| 74121 | .75 |
| 74145 | 1.95 |
| 8001 | 1.50 |
| 9388 | 3.25 |
| 74C92 | 1.95 |
| 82600 | 5.95 |
| 95+90 | P.O.A. |
| 11C90 | P.O.A. |

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| | |
|--------|------|
| 8 PIN | .38 |
| 14 PIN | .39 |
| 16 PIN | .45 |
| 24 PIN | .78 |
| 40 PIN | 1.25 |

TOROIDS, etc.

| | |
|---------------------|-----|
| IRRESPECTIVE OF MIX | |
| T-12 | .70 |
| T-25 | .75 |
| T-37 | .80 |
| T-50 | .85 |
| T-68 | .95 |

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| | |
|------------------|------|
| FIBREGLASS — | |
| 4" x 3 1/2" S.S. | .75 |
| 6" x 4" S.S. | 1.20 |
| 8" x 3" S.S. | 1.20 |
| 8" x 8" S.S. | 1.50 |
| 8" x 8" S.S. | 2.20 |
| 12" x 4" D.S. | 2.90 |
| 12" x 12" D.S. | 6.00 |
| 6M CONVERT | 2.50 |
| 2M CONVERT | 2.50 |

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| | |
|-------------|-----|
| NEOSID732/1 | .26 |
| 5027/6PLB | .20 |
| 7100CAN | .20 |
| 5200/6PLB | .25 |
| 7300CAN | .25 |
| F16 or F29 | .12 |

VALVES

| | |
|----------|--------|
| 6DQ5 | 7.25 |
| 6K6K | 4.95 |
| 12BY7A | 1.95 |
| OD3 | P.O.A. |
| 7360 | 7.65 |
| QOE04-40 | 34.90 |
| 8146 | 8.90 |
| 8146B | 9.70 |
| 8538 | 16.95 |
| 4-125A | 63.90 |
| 4-250A | 71.90 |
| 6J56 | P.O.A. |

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the ham-shack, but in the so called female domains of the house. And if by chance one essential piece of gear is mislaid just when it's needed, an equally good alternate can usually be found.

While a hair-curling wand may not quite do as a soldering iron (I haven't actually tried it yet, but it gets darned hot) it may prove to bond into shape that piece of ice-cream container you want for insulating purposes. Your coax has water in it? Just put it under the hair-dryer for an hour or so. The laundry has its use too — pegs and clothespins of various sizes are handy for weather-proofing traps for your dipoles.

The rotary clothesline doubles as a 20 metre rhombic and curtain-rods can be commissionersed if you are really hard up for elements for your beam. Hunt through your haberdashery cupboard (pre AR of course), I've just found about 1000 yards of plastic tubing from a project long since forgotten. Don't forget the sewing cupboard either — scissor-rippers are handy when working with coax, and needles of various sizes are handy for threading wire through awkward spots.

Some items must remain a YL secret lest the om's catch on and our precious stockhouse is looted while we are away shopping. After all, it's bad enough when one of our precious knitting needles is laid down for a tuning job, but I have it first-hand that a certain gentleman in Western Australia has taken to using cake-lines for chassis Heaven help us YL operators if ever the om's on to what we do use to get that job done.

Just a final word for this year from LARA — the first whole year of LARA activity — to all members, associates, friends and neighbours on the bands, a Happy Christmas and New Year. 33's from LARA.

LETTERS TO THE EDITOR

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publishers.

The Editor,

Dear Sir,

Some experimenters trying my noise cancelling circuit in AR, Oct. 78, may be having difficulty in obtaining an effective noise null. This is because there is no provision on adjustment of phase, except for that which can be obtained with the noise antenna tuner.

By inserting a switchable phase reversing transformer (ref. Orr's Radio Handbook pp. 25-13), a much improved null can be obtained.

Constructed the same as T2 and inserted between the main antenna and R2 with the pot. a. reversible so as to obtain a ether 0 or 180 degrees phase shift.

I would like to hear from experimenters using the circuit and learn of their travels.

David Diamond VK3XU.

The Editor,
Dear Sir,
Having been a member of the WIA since 1920 I feel that it is time that I voiced my complaints about the present way "AR" is produced and distributed.

This is brought about by the fact that the October issue only arrived yesterday (Friday 10th) and in the issue that I received there was no VK3 insert or information about the Eastern Zone Convention.

For many years "AR" was always in the members' hands within the first day or so of each month and on occasions was out before the beginning of the month.

With the present drive for new members it is time to get the magazine out at the beginning of the month again as it is very disheartening to wait day after day for the "Mag" to arrive.

Much has been said about the high cost of publishing "AR" and I cannot understand why it is necessary to have it printed on such expensive

IONOSPHERIC PREDICTIONS

Len Paynter, VK3ZGP

PREDICTIONS.

Have recently been composing the two basic prediction charts supplied by IPS, the MUF/ALF charts and the Graplex series as used to prepare the AR charts. Along with the current monthly preparations was a series of planning predictions based on various sunspot numbers.

The latter were quite comprehensive listing the spectrum from 3-40 MHz and it was surprising the detail shown that is not evident in the usual MUF/ALF series.

This was prompted by an article in the ITU Journal by Charles M. Rush, USAF Cambridge Research Laboratories on "Ionospheric observation networks for use in short term predictions". My own short exposure has led me to follow short term variations in the structure of the ionosphere. These variations lead to changes that differ significantly from the monthly averages for MUF/ALF.

Comparisons between the MUF/ALF curves and the Graplex system do allow for a closer watch being made on the possible departure from average particularly during the period prior to, and subsequent to disturbances — that affect propagation.

The paper was interesting in that it proposed a global network of observatories, that could rapidly exchange information of local conditions that are reflected by other times, geomagnetic disturbances etc., so predictions could be rapidly made available to users.

The proposition that short term observations provide early indications of the ionospheric structure and electron content, can do without formulas. The emphasis being placed on observing and predicting changes in the electron density region of the ionosphere, determining the characteristic of long haul HF circuits.

The so many use the MUF/ALF curves as gospel is unfortunate. Because they vary hourly, daily, it is necessary to be able to observe and note just what is going on.

The predictions could well be described as a guide to when a particular path should be open when all the conditions used in preparing the prediction has been met. At this time in the Solar Cycle, an increase in solar activity will enhance conditions, where a large geomagnetic disturbance will degrade.

The provision of a world-wide ionospheric research network to put information into the hands of users without delay could revolutionise predicting and make it very similar to weather forecasting in general. The extremes that scientists want to in the manned lunar probes goes to show how their resources can be marshalled to provide service to users.

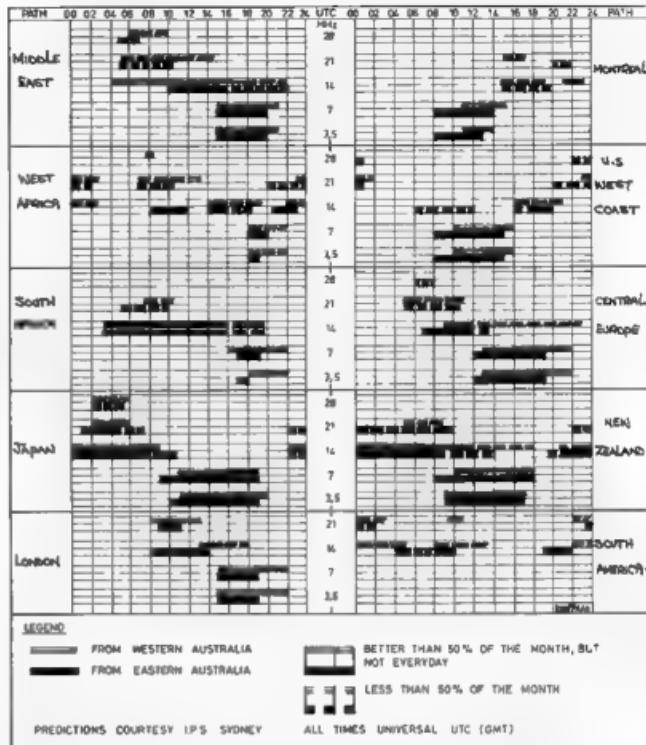
No doubt the costs will kill the proposal but there is no reason why amateur operators throughout the world could not form their own ionospheric alert network. Amateur communications have a wide diversity of systems and should be capable of forwarding information world-wide in a very short

paper. The NZART publication 'Break In', 'Electronics Aus' and many other periodicals use a good class of newsprint paper which must be cheaper than that at present being used for "AR" and consideration should be given to cutting costs by using a cheaper grade of paper.

If the placing of inserts in the magazin defeys the posting of same then it is time to cut the inserts out and have extra pages printed in the Mag. for the various State's notes as was done many years ago.

I realise that a lot of voluntary labor goes into the preparation of "AR" and while we appreciate the work that is being done, there is no excuse for the late arrival of the publication.

It is hoped that you will get the magazine out on time in the future even if it is necessary to change the printer or members of the committee (who are not pulling their weight) to do so.



period. A network of stations with RTTY could push data and retain this data for use for local access almost round the clock. Interesting thought? "Dial-a-forecast" service for everyone!

What were your experiences during the recent eclipses? I trust you have made your own observations for your records. I would be interested to hear from you.

Well this is the end of another year and a very quiet year from an activity point of view. The smoothed running sunspot number continued to decline, though increasing numbers of Cycle 21 spots are now in evidence. It does look like

the smoothed low of 5 will be reached early in the new year. If the activity increases by March then there is a strong possibility that activity will rise fairly quickly. The next possible low in lieu of March is the following August. In all 1977 should be worth watching.

The next maxima is expected to be a smoothed number of around 50 — or equivalent to the 1974 period and occur around 1984. Guess 10m will not be very active. Wonder what WARC products?

Wishing you all the best of DX in 1977
73's VK3ZGP/NAC.

"AR" means a lot to the country ham, in particular, and I trust that we can look forward to an improved service from now on.

W. R. Jardine VK3ZP.

The Editor,

Dear Sir,

I was interested to read the article by P29EM/VK4AEM in the September AR. I feel however a few clarifications would be worthwhile. Although (obviously) not a frequenter of the HF bands, I have some knowledge of the events described as I was resident on Tahiti at the time the incident occurred.

Firstly, some pieces of geography.

The island where the accident occurred is known as Rapa, the real name of "Touboulwai" is Tahuata — both islands in the Australies group. Tahuata is about 24-30 hours steaming from Rapa

and 2 hours flight time (Fokker F27) from Papeete. Whilst the "normal" steaming time from Rapa to Papeete (in a cargo schooner — like the "Tuhua Pea") is about 50-60 hours.

My heartfelt congratulations to all the ham and others involved on this occasion. However there is a definite lack of enthusiasm by the local authorities in Tahiti to give much credence to any report delivered by "Radio Amateurs". The reason for this stems from the reluctance of visiting yachts equipped with amateur gear to apply for French licensing but continue to operate whilst anchored in port at Papeete — which to all intents and purposes is an illegal act (within the 3 mile limit). The other problem lies in the fact that a reasonable proportion of these same yachts do not have crew holding amateur licences, but take advantage of the high seas to use a motley collection of Panamanian, US, 5th. American etc

for continued objection to the exercise of a fundamental right.

2. Rightly or wrongly the expressed viewpoint of the Institute (some facets of which were quoted out of context in the October 1976 issue of AR) has been taken as a contrary one by those seeking legitimate use of the Citizens Band. Recent television interviews with (currently illegal) operators have made this quite clear.

3. It is the Moarabin Club's opinion that ultimately the Institute's stance cannot remain substantially neutral as is now the case. Ultimately the Institute will have to come out either for or against the aspirations of would be Citizens Band users. In the event the Institute did not find in favour of Citizens Band users, it must be clear that the more cogent the "contrary" arguments put forward by the Institute the greater is the probability that these same arguments could be applied against the Institute and its members.

4. Current information indicates that (legitimate or not) there are already more CB equipment in Australia than amateur equipment. It follows then, that there are already more CB operators than amateur operators. In terms of future Institute membership it seems more pragmatic to foster alliance with CB users than to oppose them or ignore their existence. In the event that the present demands in respect to Citizens Band are met, it is not "unreasonable" to assume that some form of Citizens Band Association will be formed. Such an association will, solely by virtue of the probable number of adherents, be at least equal in influence to the Institute so far as the general public and the Regulatory Authorities are concerned. It is not impossible that such influence could exceed that of the Institute.

5. It would be to the Institute's advantage to see a separate — and legitimate — means of lay communication established. Those wishing simply to have a communication facility could use authorised frequencies (instead of being tempted to "pirate" on amateur bands) whilst those wishing to become technically competent in the design and manufacture of equipment for themselves could, perhaps, lend towards the amateur ranks. Would it be any sacrifice at all if the Australian Amateur Service freely gave up its 27 MHz allocation to CB users?

6. It is a fact of life, however unpalatable to regulating authorities and/or amateurs wishing to maintain the status quo, that mass communication systems will not stop developing and that to the amateurs in general it is their and their associations did not objectively recognise the traumatic changes of recent years. The belief that amateurs are still a privileged race has been outmoded by the very technology they espouse.

Toffler in his book "Future Shock" clearly describes the denial of people and organisations who refuse to acknowledge change or who refuse to accommodate change. Their sphere of influence and interaction becomes vanishingly small and may go to the grave as vegetables.

Let this not happen to the Institute.

Yours faithfully,
Harold L. Hepburn VK3AQF
Committee member, Moarabin and District
Radio Club.

PROJECT AUSTRALIS

David Hull, VK3ZDH

AMSAT-OSCAR 6 and 7 ORBITAL DATA CALENDAR
In co-operation with AMSAT, Skip Reymann, W6PAJ has published an improved AMSAT-OSCAR orbital data calendar containing all orbits for 1977 for both AMSAT-OSCAR 6 and AMSAT-OSCAR 7. Designed so that it may be hung on the wall, the calendar includes information on the operating schedules and frequencies for both spacecraft, and also the telemetry decoding equations. Also included is step-by-step information on how to determine times of passage of the two satellites.

The orbital calendar is available postpaid for \$5.00 U.S. funds or \$0.10 C.R.C. (\$3.00 to AMSAT

members, and free to AMSAT Life Members). Overseas orders will be airmailed. Orders and payments should be made to:

Skip Reymann, W6PAJ
P.O. Box 574,

San Dimas, California 91773, U.S.A.

Please include a gummed, self-addressed label with your order to speed up processing.

Proceeds from the Orbital Calendar benefit AMSAT.

OSCAR 6

JANUARY 1977

| Orbit Date | No. | Time | Long | Orbit Date | No. | Time | Long | |
|------------|---------|------|------|------------|-----|-------|-------|-------|
| Month | Day | Z | W | Month | Day | Z | W | |
| 1 | 19/2/64 | 01 | 24 | 79.60 | 1 | 07/39 | 01:48 | 77.09 |
| 3 | 19/2/69 | 01 | 18 | 78.35 | 3 | 07/64 | 01:42 | 75.59 |
| 2 | 18/2/70 | 02 | 23 | 64.60 | 2 | 07/51 | 00:48 | 61.97 |
| 4 | 19/3/61 | 01 | 18 | 63.35 | 4 | 07/76 | 00:41 | 60.47 |
| 5 | 19/3/14 | 01 | 13 | 77.10 | 5 | 07/89 | 01:38 | 74.09 |
| 6 | 19/3/25 | 01 | 13 | 82.10 | 6 | 08/01 | 00:33 | 71.59 |
| 7 | 19/3/38 | 01 | 06 | 78.85 | 7 | 08/14 | 01:29 | 72.56 |
| 8 | 19/3/51 | 01 | 08 | 60.85 | 8 | 08/26 | 00:53 | 57.97 |
| 9 | 19/3/64 | 01 | 03 | 74.60 | 9 | 08/39 | 00:23 | 71.06 |
| 10 | 19/3/77 | 01 | 04 | 66.84 | 10 | 08/51 | 00:22 | 55.97 |
| 11 | 19/3/89 | 00 | 58 | 73.35 | 11 | 09/14 | 00:16 | 69.56 |
| 12 | 19/4/02 | 01 | 53 | 87.10 | 12 | 09/78 | 00:15 | 54.47 |
| 13 | 19/4/14 | 01 | 53 | 72.10 | 13 | 09/89 | 01:10 | 68.08 |
| 14 | 19/4/27 | 01 | 48 | 85.85 | 14 | 09/01 | 00:09 | 52.97 |
| 15 | 19/4/39 | 00 | 48 | 70.85 | 15 | 09/14 | 01:04 | 66.59 |
| 16 | 19/5/02 | 01 | 42 | 64.60 | 16 | 09/26 | 00:03 | 51.47 |
| 17 | 19/5/14 | 01 | 42 | 69.60 | 17 | 09/09 | 00:57 | 56.09 |
| 18 | 19/5/27 | 01 | 37 | 83.35 | 18 | 09/52 | 01:51 | 78.71 |
| 19 | 19/6/08 | 01 | 37 | 68.35 | 19 | 09/84 | 00:51 | 63.59 |
| 20 | 19/6/20 | 01 | 32 | 82.19 | 20 | 09/77 | 01:45 | 77.21 |
| 21 | 19/5/14 | 01 | 32 | 67.10 | 21 | 09/88 | 00:44 | 62.09 |
| 22 | 19/5/27 | 01 | 27 | 80.85 | 22 | 10/02 | 01:39 | 75.71 |
| 23 | 19/5/39 | 01 | 27 | 65.85 | 23 | 10/14 | 00:38 | 60.59 |
| 24 | 19/6/02 | 01 | 22 | 79.60 | 24 | 10/02 | 01:32 | 74.21 |
| 25 | 19/6/14 | 01 | 22 | 64.60 | 26 | 10/26 | 00:03 | 59.05 |
| 26 | 19/6/27 | 01 | 17 | 75.85 | 27 | 10/09 | 00:26 | 72.71 |
| 27 | 19/7/08 | 01 | 17 | 63.35 | 28 | 10/77 | 01:19 | 55.79 |
| 28 | 19/6/20 | 01 | 12 | 77.10 | 29 | 10/77 | 01:19 | 71.21 |
| 29 | 19/6/14 | 01 | 11 | 62.10 | 30 | 10/89 | 01:19 | 56.09 |
| 30 | 19/6/27 | 01 | 06 | 75.85 | 31 | 10/92 | 01:12 | 69.71 |
| 31 | 19/5/39 | 00 | 06 | 69.85 | 31 | 10/14 | 00:12 | 54.59 |

WIA CONVENTION ROCKHAMPTON

The Convention of the Central Queensland Division of the WIA held on the 28th and 29th of August was indeed a huge success.

The guest of honour, Mr. David Wardlaw VK3ADW, the Federal President addressed a gathering of well over 100 and spoke of the necessity of amateurs and would be amateurs to fully support the WIA in its WARC work, of course never has an appeal been more urgent.

The repeater VK4RAR — R42 made its debut and Adrian Billard VK4MM gave a summary of its operation. Adrian was responsible for its electronics.

The smorgasbord was nothing less than a gourmet's delight.

The fox hunts saw very short lived foxes. Older "hams" of 60 years plus were seen racing like greyhounds through the undergrowth, such was their enthusiasm.

A 144 MHz signal was heard in Brisbane from Mount Archer the "local hill".

The prize winning antenna that accomplished this feat, a yagi with a 20 foot boom was seen heading towards Biloela after the convention, in the charge of its new owner. He's coming back later for the "Hill".

The ladies had a lovely time discussing their complexion with a skin care spe-

cialist who displayed a colourful array of cosmetics. For a radio convention, this we understand is a unique idea with great merit.

My solid state after burner, an exhibit, now smells like Ashes of Roses. Ah well!

Exhibits spanned a half century of progress. The equipment displayed ranged from a horn speaker of the early 1920s to colour TV cameras and monitors.

The convention was rounded off with a barbecue of succulent local steaks, salads and hot meals.

The committee, the organisers and the ladies must be elated at the compliments in praise of their efforts. Well done Rockhampton.

— VK5CBG/VK4 John W. Emmet PR Officer, Central Queensland Branch WIA. ■

QSP

IONOSPHERIC INDUCED INTERFERENCE

FCC has been told "that by allowing AM 'clear channel' radio stations more power, other signals passing through the ionosphere could be harmed. These harmful effects could manifest themselves as interference, scattering and severe weakening of signals. Currently, 'clear channel' stations, those given an AM frequency between sunrise and sunset in order to eliminate interference, are restricted to 50 kW. In order to overcome the unsatisfactory night-time service suffered in some areas it had been proposed that the power output be lifted to 750 kW." The Telecommunications Journal Aug. '76 article carries on to say that a further field test is to be conducted.

HAMADS

- Eight lines free to all WIA members, \$8 per 3 cm for non-members.
- Copy in typescript please or in block letters to P.O. Box 150, Toorak, Vic. 3142.
- Commercial advertising is excluded.
- Closing date: 1st day of the month preceding publication. Cancellations received after about 12th of the month cannot be processed.
- QTH means the advertiser's name and address are correct in the current WIA Radio Amateurs Call Book.

FOR SALE

Selling Whole Station — includes Marconi OR150 receiver (2-50 MHz), home brew VHF AM transmitter, 52 thru 575 MHz. Miscellaneous of converters, power supplies, valves, transistors, boards and random bits. What offers? VK3BAR QTH. Ph. (03) 725-8702 A.H.

Uniden 2068, as new condition, \$500. VK2BZ. Ph. (02) 546-2020.

F1610 Transceiver, no mode, good condition, VK2BZB. Ph. (02) 84-7170 A.H. (02) 631-7588 B.H.

FTDX 400 Transceiver, good condition, \$325. VK2AAC, 20 Timaru St., Kirrawee 2232. Ph. (02) 521-7050.

KW Viceroy 10-80m SSB/AM/CW Tx and Hammarlund HQ170 Rx, no 2m, \$230 O.N.O. VK2ATT. QTH. Ph. (02) 478-2699.

MT2A Hallicrafters, Tx 240V AC PS, complete with mic. and instruction book very good order, \$175. VK1000 Linear, EC instruction book, \$230. VK2BDN. QTH. Ph. (02) 747-5149.

Acetron 12 volt mobile type 3000 power supply w/ circuit, wired for FT2000 transceiver, all voltages for other transceivers, high, low, bias, etc. Can be changed for other sets. \$75.00. VK3JK. Ph. (02) 431-4738, QTH.

HW-7 QRP transceiver (going HW-8), numerous associated FOF transmitting valves (\$13, \$8, \$11, \$16, \$22, \$60GS, \$60GS etc.) list supplied on request, 40-10-25 band (going X-Q quad), RG-8 coax approx 60 ft. VK5HP. 17 Brodie Crescent, Christies Beach, S.A. 5165. Ph. 382-4198.

YAESU FT101 Transceiver 10-160 Mx, model prior to 'B', min. condition, no mods, complete with P/T mike, headphones, etc. \$400. H. Crisp VK2LXH, QTHR. Ph. (047) 92 2390.

YAESU 588-CW Base or Mobile Equipment, FT75 with 100 watt, 1000 watt, etc. \$400. H. Crisp VK2LXH, QTHR. Ph. (047) 92 2390.

Collins 755-3 Rx 10730 and 3251 Tx with DX envelope, complete model LC-1-325, complete with astatic 100 mic. G stand, 516F-2 power supply and HD 250/110 V ac/mi box with cutout transformer. Linear amp. \$800. Heathkit (250 watts). Beam 3J3JR, 3 element and rotator. VK6NE, QTHR. Ph. (092) 46 3232.

MRISSA K11s for Ch. A, 40 repeater 2 repeater 4, very good condition. VK2ZY1, QTHR. Ph. (03) 82 7862.

YAESU-MITSU FT200-PP205, mint condition, complete unit including all 10m sets, square valves, new valves fitted, no mods, good for source use, found it cannot be set locked. \$300. Apply 23 Walden Street, Newstead, 7250, Ph. (003) 44 4172.

FT200, FP200, VF200, not 3 years old, mint cond., no mods, 10m sets, square valves, new valves, fitted, no mods, good for source use, found it cannot be set locked. \$300. Apply 23 Walden Street, Newstead, 7250, Ph. (003) 44 4172.

Re ARR, with handbook and speaker, less power supply, \$15 or nearest offer. QRC, SBP1, in working condition, 2 spare CRT's, circuit, \$20 o.n.o. VK3BBK, QTHR. Ph. (03) 58 884 A.H.

Kenwood TR7200SG, VHF/MW transceiver, complete with all accessories and English instruction manual. X11 for Ch. A, Ch. 50 plus T/R 145.84 and 145.95. As new used for home station only, \$185. Ross Treloar, VK2BZP, Ph. (02) 239 5867 Bus.

Collins 202B Transceiver, 3 yrs. old, mint condition, \$1100. FTDX400 ext. VFO and matching speaker, \$400, excellent performer. FTRDX400 Rx FM 2 and 6m, \$325. FLDX Tx, \$225. VK7AZ, QTHR. Ph. (002) 44 1165.

Bandix LM77 frequency meter complete with AC power supply, \$30. VK3TB, QTHR. Ph. (058) 88 8765.

FTV-650 6m transceiver, used only once, ex. cond., complete all accuse in box, \$130. MTR-137 6m FM transceiver \$252. MHZ. \$50. 8m 5.1m, asam, folded, dipole. D.E.I. ex. cond., \$40. Dictaphones, good cond., P.B. units and mics, \$10 each. Bruce Kendall VK3ZDM, 10 Carter Cr., Werribee, 3030. Ph. (03) 741 2332.

Osker SWR and power meter as new, \$40. Kenwood Cardiod dynamic disk mike, new, \$37. MFJ super logarithmic speech processor, unused model LSP 520. Bus 11, \$50. RF Ammeter 0-5amps, \$6. Eric Bierse, VK2BEK, 8/85-88 Florence Street, Hornsby, N.S.W., 2077. Ph. (02) 478 5092.

Realistic "Patrolman" B" RX, very good cond. with AM, SW, FM, VHF, UHF (450-470 MHz) and air. FM has been tuned to portion of lo-band, \$30 (sell new \$130). National IC-212 tape recorder, ex. cond., \$40. IC-22 repeater 2B, ant II, R, 4, & 50, simplex 37, 40, 43, 49, 50, 51, 53, 61, 65, 70 V, \$300. Europe-B 2M transverter for use with FT101, \$150. Lionel, VK3NM, QTHR. Ph. (03) 88 8710.

Healthkit Model HW-22A, 200 W PEP sideband transceiver, with homebrew 12V DC power supply. Little used, best offer. VK2ABW, QTHR. Ph. (02) 88 1601.

Ken KP202 2m FM fitted with simplex channel's 40, 50, repeater channel 2, 4, 6, 8 with Nicad battery compact battery charger, KEN leather case, stubby helical antenna, manual, \$140. VK3YGR, Ph. (03) 765 2792.

Icom IC-22A 2m transceiver, 7 channels, mobile mount, manual \$170. Marc Jackson VK5ZBH, 219 Peachey Road, Smithfield Plains, S.A. 5114. Ph. (08) 87 3220 Bus. or (08) 254 7515 A.H.

WANTED

YAESU FTV650B, FTV200B, FT101E. Bob. Ph. (02) 646 0425 Bus. (03) 46 3727 A.H.

Your Reports on propagation during the total eclipse. Forward to VK3AFW, QTHR.

SILENT KEYS

It is with deep regret that we record the passing of —

Mrs. H. A. GROUSE VK3AOK
Mr. A. J. MARTENS VK5KMA
Mr. C. J. OTHEN VK5OM

JOHN WINTON VK5KXR

John was first licensed on 10 June, 1932, and was Secretary of the WIA in the early thirties. He was very active until the war years and was seriously wounded in June, 1945 at Bougainville.

It was not until the 50's that he became active again with projects, and during the 60's he began transmitting again.

John was plagued with illness since his retirement 4 years ago, but never lost his interest in electronics and amateur radio. John Winton passed away on 4th June, 1976, aged 66, and we extend our deepest sympathies to his widow, Margaret, and family and friends.

Derived from information supplied by Com VK5KXR.

PETER LEMPRIERE VK3JALL

On Monday, 27th September whilst in transit to a club meeting at South Melbourne, Peter Lempriere VK3JALL suffered a heart attack and passed away.

Peter had been a licensed amateur for many years and was chiefly responsible for starting the Disabed Radio Amateur Club — VK3ZEE.

The Club was constituted in May, 1975, and has met actively over the past 3 years, and held events and other activities.

The principle aim of the Club, as originally envisaged by Peter, is to foster interest in Amateur Radio amongst disabled and interested able bodied persons. Equipment used at the club includes an FT200, IC21A, DV21 — TH3 Mark 3 beam and other gear.

This equipment has been purchased with the help of the Victorian Society for Crippled Children and Adults, mainly through the efforts and with the direction of Peter Lempriere.

He was the driving force behind the Club and will be sadly missed by everybody. All club members express their sincere sympathy to Peter's family.

Ian Westerland, President; Ted Egan, Past President, Disabed Radio Amateur's Club.

ERIC GORDON PUGH VK3ADK

Eric gained his licence on 15th March, 1966, and established his first amateur station at Collie Harbour, N.S.W.

Later he moved and re-established his station at Lismore, Kempsey, Concord West and finally at 302 Morrison Road, Ryde, where his towering beam has been a landmark for years.

Tx or Tx/Rx for all bands CW or CW/AM only; commercially made. VK5QO, QTHR.

RTTY Demodulator wanted. G. G. Glendinning, 4 Hayes Lane, Mackay, Qd. 4740.

FT-401B Transceiver with manual, must be good, details, including mods, if any, to VK2PT, QTHR. Ph. (049) 43 1308.

Eddisons general coverage receivers; Collins 32V3, Johnson Valiant or Drake 2NT transmitters. Price and condition details to David VK5HP, 17 Brodie Crescent, Christies Beach, S.A. 5165. Ph. 382 4159.

Buy or photograph manual for Lafayette TE-30 CR Analyser. Details to David VK5HP, 17 Brodie Crescent, Christies Beach, S.A. 5165. Ph. 382 4159.

Galaxy GT558 or Galaxy 3 Mark 3 with 100W, remote VFO, VOX and computer interface. Good original condition essential. A. E. Collyer, VK5ZB, 26 Blundstone St., Elizabeth South, S.A. 5112. Ph. (08) 255 2249 bus. hrs. or (08) 255 7506 A.H.

Eric might well be regarded as one of the most widely known "Hams" in the world as he has been constantly involved in DX since 1950 to 1984. Eric and his XYL Alice visited U.S.A. and they met a number of DX friends in person.

Eric Pugh was a most dedicated "Ham" and he always built his own equipment to precision standards.

Eric spent 27 years on the staff of 2GB at Sydney and had not long commenced to live in retirement when his unexpected sudden death occurred at his QTH on his 64th birthday, 11th October, 1978.

John VK2ADN

BILL LEWIS VK2YB

Because of his intense interest in the Wireless Institute, I feel more should be known regarding the late Bill Lewis, VK2YB, then just a mention in the list of "Silent Keys". Prior to obtaining his licence in 1926, he was an active member of the Croydon Radio Club which had the call of VK2YB and when that club handed in the call, Bill applied for it.

He joined the WIA in 1926 and was always a valuable member, performing many functions for the VK2YB Division, including 2 years as President, a number of periods as a member of Council, a member of the Dural Committee, member of the Constitution Committee.

VK2YB was a regular call heard on Field days during his amateur career and Bill felt it a duty in some respects to always take part in the John Moye Memorial Field Day and had already made plans for the next one.

His interest was CW and only recently built a Heathkit HW501 transceiver, but rarely used the microphone.

Bill had other interests as well as amateur radio. He was a member of the RAAF and prior to World War Two operated as VK6YB whilst based at Pearce. Later he was to be commissioned as a radio officer. On Anzac Day he normally marched with 100 Squadron.

After World War Two he opened a radio and electrical business in Oxford Street, Paddington under his old call. In recent years he moved to Ryde and it was only just before his death he received his DXCC certificate.

His first heart attack occurred 10 years ago, and was to affect his life style from then on, but Bill would not give in.

From 1962 until his death, he was a member of the Western Suburbs Motorcycling Club and in his early days rode a Harley Davidson machine, christened "the wreck of the Hesপুর".

Ten years ago he became a member of the well known and popular Sydney Male Chorl and at the Chapel service, four members of the choir sang as a tribute to their late member.

For myself, I have lost a close friend of over 40 years in amateur radio.

VK2QH

Use a tried and proved speech processor to improve performance of your 101, 101B or 101C on both transmit and receive! The G3LLL RF CLIPPER is designed specifically for these sets. Operates on all HF Bands and is particularly effective when used on Novice power limit, or mobile. Also, limited availability of new model to suit FT-200. Special Xmas price — both models \$75. Available from:-

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Technical Data:

Frequency response 16 ... 20 000 Hz. Impedance 2 000 Ω . Weight 170 g. Cable length 3 m.

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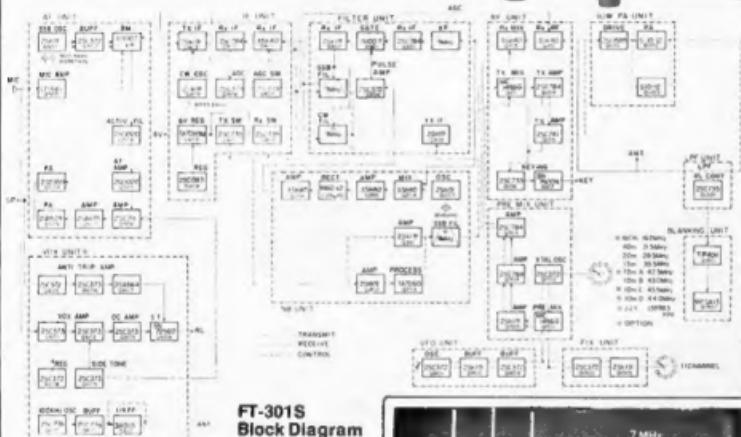
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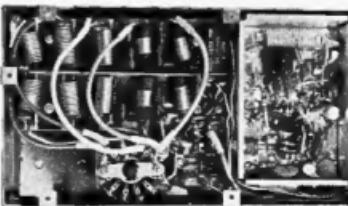
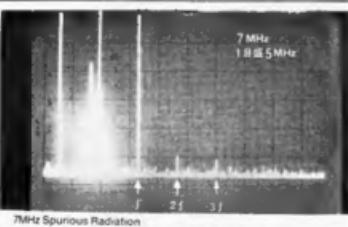
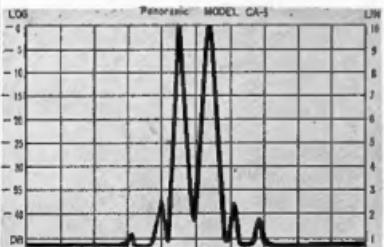
Latest addition to
the YAESU line —

FT-301S ALL SOLID STATE HF TRANSCEIVER

The FT-301S is an advanced fully solid state H.F. SSB and CW transceiver covering 160 m. thru 10 m., including one auxiliary band and WWV. It has all the outstanding features of Yaesu's top performance FT-101E (inc. built in RF Processor) plus many more additions (compact, solid state final, low power consumption).



Seven crystal locked channels and 10 Watts PEP make the FT-301S particularly suitable for the new Novice and, at a later date, a 100 Watt commercial amplifier will be available from Yaesu, enabling the FT-301S to be up-converted to 100 Watts. Other outstanding features include automatic high VSWR protection of the final amplifier output, transistors and selectable 100 KHz and 25 KHz calibration. Special care is taken to reduce unwanted harmonic radiation by the inclusion of separate double section Low Pass filters for each band. Stocks of the FT-301S are expected toward the end of September.



Technical Data

Frequency Range

160m 1.8-3.5 MHz

40m 7.0-7.5 MHz

20m 14.0-14.5 MHz

15m 21.0-21.5 MHz

10m A 28.0-35.5 MHz

B 28.0-28.5 MHz

C 29.0-29.5 MHz

D 30.0-30.5 MHz

WWV 5.0-5.5 MHz

Modulation

SSB, USB, (A3J)

Input Power

A1, A3J 20 Watts DC

Carrier Supp.

±100 KHz 40dB

Adj. Sideband Supp.

Better than 40dB

Spurious Radiat.

±100 KHz 40dB

Audio Response

300-7000 Hz ±6dB

Intermod. Distortion

3rd order 100mV

Frequency Stability

300 Hz or better within the first 30 minutes and less than 100 Hz after

warmup

Output Impedance

50 Ohm

Mic Impedance

500 Ohm

Power Supply

0.5W at 1000 S/N

Image Rejection

Better than 50dB

Selectivity

SSB —5dB at 2.4 KHz

—5dB at 4.0 KHz

CW —5dB at 0.6 KHz

AM —5dB at 1.2 KHz

Crossmod

Better than 60dB with a 20dB signal at the antenna terminal 20 KHz away

Antenna

20m 100W T-HD

Output Impedance

4 Ohms

Supply Voltages

Receive 0.4 Amp

Transmit 3.0 Amp (at 10W)

Receive 40 VA

(With FP-301) Transmit 110 VA (at 10W)

Dimensions

260mm wide, 125mm high, 250mm deep

Weight

7.5kg

Options

Anticipated Prices

FT-301S Transceiver \$568

FP-301 Matching VFO \$130

FP-301 Heavy Duty AC Power Supply \$148

(May also be used to power 100W final)



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